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THE state of New York has at last made appreciable progress in the abolition of highway grade crossings—at least in New York City. The annual report of the Public Service Commission for the First district, noticed in another column, shows how the legislature has granted $250,000 for this purpose during the past year, and how it ought to appropriate $600,000 this year. These are large figures, but the commission has before it a large problem. The state's appropriation is intended to defray one-fourth the cost of these works—which means that New York City needs $2,400,000 this year. As the city has only about one-twentieth of the state's crossings the reader will see why we do not mention the estimated needs of the whole state—the figures would be staggering. And yet the only way to deal with this subject is to grapple with it, directly. There is no possible evasion, no chance for a flank movement. This has been shown by the experience of those cities which have abolished crossings, and of the state of Massachusetts. In the city of Chicago alone mountains of gravel have been used in this work, and it has all had to be paid for in hard cash, mostly by the railways. Probably the grade crossings within the city limits are in more pressing need of abolition, as a whole, than those in the rest of the state, but it will not do to assume that New York City is all like Broadway and Forty-second street; some of its solitudes will vie with the interior of Kentucky in wildness. Every important town in the state has dangerous crossings, and it is only by thinking in millions that the problem can be even approached. Not only the commission for the second district of New York state, but the commissions of 40 states have before them this same problem. To defer or ignore it means a continued record of deaths and injuries, except as the speeds of trains are rigidly limited.

A MOVEMENT is under way at St. Louis for the formation of a federation of commercial organizations in that city, and it is proposed to bar from it all organizations having railways or railway men as members. The purpose, it is said, is to save the organization from the embarrassment that results when litigation with railways regarding rates and similar matters is conducted by an association to which they or their officers belong and contribute. This is an interesting case of separating the sheep from the goats. Perhaps, however, it is more consistent than the policy followed by a good many commercial organizations. For example, while the railways entering Chicago belong to the Chicago Association of Commerce and contribute to its support, this association has become one of the most active organizations in the country in carrying on agitation and litigation against them. It solicits and accepts their money and fights them with it. For some time after the Hepburn act was passed we heard a great deal of talk about co-operation between the railways and the shippers. The plan to form a federation of commercial organizations at St. Louis from which railways and railway men shall be barred is, we fear, a good illustration of the extent to which in most places such co-operation has not materialized. The traffic managers of industries and of commercial organizations have always been quite willing to co-operate with the railways to bring about lower rates or better service; but most of them have consistently fought in the last ditch, and often by methods the most unfair and even unscrupulous, every proposition the adoption of which would benefit the railways. It is not merely the Illinois Manufacturers' Association that has been unfair; everybody knows it is; but even commercial organizations which in the past have been very moderate and reasonable have apparently lost the last vestige of the spirit of co-operation since the controversy over advances in freight rates began. The *Chicago Evening Post*, in an editorial in its issue of January 3, called attention to the fact that the railway officers who contributed articles to its annual review number were much fairer in their utterances than was the traffic director of the Chicago Association in an interview at about the same time. It remarked that the spirit shown by the railway officers was "in direct contrast with the rather astonishing interview" given by the traffic director of the association, who, it said, "spoke as if the railways were surreptitiously trying to raise rates, and as if he were challenging their right even to make such an attempt." Thus, the *Evening Post* continued, "we have the surprising spectacle of seeing this great association appear as an anti-railway crusader. Can the interests of the manufacturers who compose it be separated from and set over against those of the railways? Is not the prosperity of the one inextricably interwoven with the prosperity of the other?" If commercial organizations are to be conducted in future as many of them have been in the recent past, we imagine railway officers will not be very much pained if they be excluded from

their membership. Probably a good many of them feel that this segregation of the sheep from the goats can do the railways no harm, since many of the commercial associations have been making the railways the goat for some time, anyway.

THE SCREW REVERSE GEAR.

THE screw reverse gear may be regarded as a well-established detail of standard practice on foreign locomotives. Vaughan Pendred, whose book on "The Railway Locomotive," is not confined to British practice, says, "The reversing lever has been superseded in all modern locomotives by a hand wheel and quick thread screw." The screw reverse lever has been used experimentally on a few locomotives in this country, usually where the master mechanic was an Englishman who had had practical experience with it and understood its advantages, but it has never been adopted as a standard by any of our railways.

The necessity for greater force in the reverse mechanism was recognized in this country 30 years ago, when steam power reverse gears were used on locomotives weighing only 50,000 lbs. on drivers and with cylinders 18 in. by 24 in. They were applied to passenger engines on fast runs where the friction of the flat and unbalanced slide valve made it difficult to adjust the reverse lever while running. A steam reverse gear designed by Wm. E. Good was used in 1882 by the Reading Railroad on its fast trains between Philadelphia and New York, and one designed by W. P. Henszey of the Baldwin Locomotive Works was used about the same time on the Central of New Jersey. With the introduction of piston valves and the use of springs or counter-weights to balance the link and other overhanging weight, the labor required to move the reverse lever was reduced. The power reverse cylinders were then abandoned, and not generally used again until the advent of the large Mallet locomotives with two sets of valve gears.

The Walschaert valve gear fortunately has the weight of the heavy link supported on trunnions, but the heavy reverse arm, hanger and radius rod are unbalanced, and these, together with the frictional resistance of the link block, valve rod, stuffing box and valve packing, place a heavy load on the reverse lever. The Stephenson link on large engines is heavy and not always balanced, and these, with the valves and the four large eccentric straps, must be moved when any change in the cut-off is made. On any type of modern American locomotive the work of moving the reverse lever is laborious and sometimes dangerous; thus it is not surprising that engineers hesitate to change the cut-off often, even when running at moderate speed, and at high speed there is a positive disinclination to work the engine at the most economical cut-off where it involves a frequent movement of the reverse lever. Good engineering requires a change in cut-off corresponding with the change in load and speed; in stationary engines this is obtained by the governor or a power regulator. The economical use of steam on the locomotive requires a similar regulation, and if it must be by manual control, then the engineer should be provided with a mechanism by which the cut-off can be easily and accurately adjusted.

The proper regulation of the cut-off is a matter affecting not only the fuel economy, but it has largely to do with irregular wear of pins, axles and tires. If the cut-off is not properly adjusted to the load and the speed excessive compression results, causing the irregular action of forces throughout the engine, which is one of the principal causes of wear and of frequent shopping for repairs. A reverse gear that will admit of and encourage the change of cut-off while running, to secure the most advantageous distribution of steam, will effect an important economy, not only of fuel, but in the cost of repairs. The screw reverse has a slight objection in that it does not permit the engineer to move the valve so directly that he may detect any slight defect, or a lack of lubrication, but the extensive use of the device on foreign roads indicates that the engineer in time is able to detect these conditions.

The power reverse gears on Mallet locomotives may answer the purpose, but they do not appear to be desirable or satisfactory substitutes for the reverse lever on large engines of ordinary types. For large passenger engines there is a pressing need for something better than the reverse lever for regulating the cut-off, and one of the locomotive builders is now designing a screw reverse lever for this purpose. There are so many designs for this detail in use on English and French railways that there should be no difficulty in selecting one which has been developed from long service, and any of our railways desiring to experiment with the screw reverse rigging can find already at hand good designs for that purpose which only need to be adapted to the peculiarities of the American locomotive.

TYPE OF THE RAILWAY STOCKHOLDER.

A FEW weeks ago a railway stockholder in a letter to the *Wall Street Journal* used these words:

"I happen to be a stockholder in several railways and it is absolutely unnecessary to mail their very voluminous and expensive annual reports to every stockholder. They are never read and go into the waste paper basket. They need only advertise that reports will be sent when asked for."

The quoted words, direct attention to the division of various types of railway stockholders into distinctive groups. Unfortunately the group of which the author of the quoted words is a member undoubtedly, is much larger than any other single group —this not merely in a masculine classification, but because so many stockholders are women. Stockholders of that sex have, indeed, in one company particularly, already risen to a clear majority of the shareowners; and the feminine interest would probably rise still higher were the trustees for women to be included. Taking a woman as a shareowner holding her railway stock absolutely, there is also, undoubtedly, a national tendency of her sex to increase numerically on the stock lists of old dividend paying lines. This follows, for one cause, from the natural tendency of the feminine shareowner, partly from ignorance, to hold on to her investment. She is, almost necessarily, a standpatter, certainly so as compared with the investing and more changeful man. The Hetty Greens, even of the most modified and diluted pattern, are few and far between. From time to time we hear edifying discourse on theories or plans to uplift the sex to the Woman of Affairs. But their effect thus far has been slight, and the railway stockholding woman remains lethargic; or the object and sometimes the victim, of advice.

She is to be pardoned rather than pitied. Not so her analogue in the other sex who rejects contemplating his copious report on his railway interest, and flings into the waste basket the compilations of figures on which a host of accountants and clerks have worked for months; who is almost, if not quite, as scornful of the published abridgments; and, what is worse, in his character as a citizen has no conception of the meanings of the word publicity until may be he has a harsh awakening. He may be dismissed from further consideration. But above and beyond him are other types of his sex, interesting if not edifying for brief study.

Ignoring the day by day speculator, who is not in any proper sense a railway shareholder, there is, first, the group in whose vision mere price is biggest. Their direct objectives are the market quotation, the opportunity for the time investment profit by sale more or less remote—less remote if their shares rise, more if they fall. Some superficial watch they keep on general or special conditions, on fact or rumor, but only as they affect the price. A little higher up is the stockholder of a more hybrid type. With the idea of market price and remote possibilities of the distant future, he joins the motive of rate of return on his railway investment. He is a combination of investor and speculator in about equal parts. If he finds an investment with a better return, even though with somewhat lower security, he is off to transfer his holdings, not infrequently to his ultimate cost. He shades upward into the shareholder who watches moderately not only general but special railway conditions, who has an eye, though a somewhat languid one, on net earnings, on decisions of the courts, and on legislation. The three foregoing groups

may be roughly bunched as non-active types. They are neither negative nor positive. Perhaps half of them will take the trouble to sign the annual proxy blank of the railway corporation and will glance hastily through the annual report. But they never file it away for reference. Internal conditions of their property they almost never seek.

At the top of the list is the stockholder of facts and figures for whom the voluminous and detailed annual report, as well as the minor and intermediate reports by months and half-years, carries not only its meanings, but its responsibilities. He reads not only the text of the railway report but delves, at some important points at least, into its figures. He does not deem it a waste of time to seek out the annual statement of the previous year and make comparisons. The noted divergences in such matters as cost of maintenance, in the ratio of expense of operation to gross receipts, in fixed charges. He may be a small holder, yet he habitually sends in his proxy. Ideally he should attend regularly the stockholders' meeting, but there, as yet, the line is drawn. But he watches his investment closely; he marks the news or comment which bears on it; the conservation of his railway dividend is more the object of his solicitude than the dividend itself; and, in his deeper moods, he has definite and ethical views on the relation of his railway to the public as well as to himself, and brackets his citizenship with his fraction of railway ownership.

It is on that final type of stockholder, champion of publicity, the man moreover whose opinion on the railway security, whether stocks or bonds, reaches as an influence far beyond himself, that the amplified railway report never goes to waste. He is not so many as he ought to be. But he is an increasing force and happily he tends to increase more and more as railway problems thicken. He is the man on whom good railway management has its best reliance and from whom bad management has most to dread.

Letters to the Editor.

THE MANNERS OF THE INTERBOROUGH.

NEW YORK, December 31, 1910.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

My attention has been called to an editorial on page 1173 of the issue of the *Railway Age Gazette* of December 23, 1910.

While we welcome just criticism and have become accustomed to unjust criticism, my only comment is that the statements regarding the inactivity of this company to relieve congestion in the subway are untrue. It appears to me that before a railway gazette should commit itself to such an editorial a reasonable effort should have been made to ascertain the facts.

FRANK HEDLEY,
Vice-President and General Manager, Interborough Rapid Transit Company.

[We said nothing of "the inactivity of this company to relieve the congestion in the subway," so that this inspiring subject is left entire, virgin soil for Mr. Hedley to cultivate. His abrupt denial was quite unnecessary. There is room left, however, for saying much of what has been done to increase the length of trains, the number of trains, shorten the schedules, open the doors and, above all, afford a fair measure of decent regard for people. Bad manners should not be a continuous performance. A very little does harm enough to the relation between the railways and the public.—EDITOR.]

USE OF BRIDGES IN EXHAUST NOZZLES.

ST. PAUL, MINN., December 6, 1910.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I note a short article in the *Railway Age Gazette* of November 25, 1910, in regard to the use of bridges in exhaust nozzles used in connection with inside stacks. In the March and August, 1908, issues of the *American Engineer & Railroad Journal*, I presented and discussed the formula $D = .49N\sqrt{L}$ L for stack diameters and showed also that L should be about 10N to 12N, the letters referring to dimensions as shown on the accompanying sketch.

A bridge of sufficient width to divide the exhaust into two jets would therefore reduce the distance from the nozzle to the choke of the stack for the best results, and this explains why a nozzle with a bridge sometimes gives better results with inside

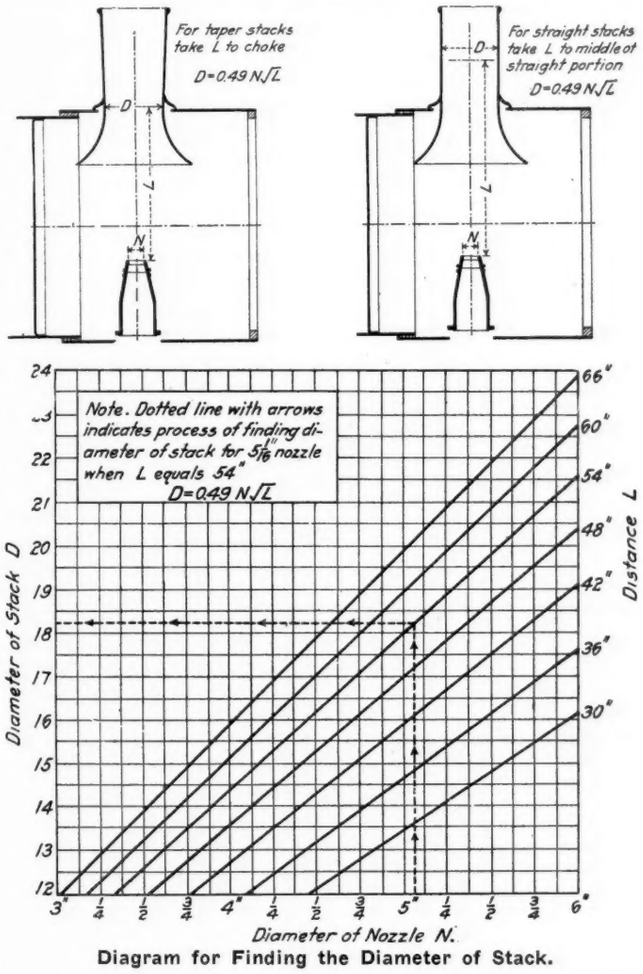


Diagram for Finding the Diameter of Stack.

stacks, where L is necessarily short, than a single nozzle of equal area. These formulae are based on the Master Mechanic's tests made in 1896, 1903 and 1906, and agree with all that are comparable.

The present Master Mechanic's formula cannot be depended on to give proper stack diameters, as the diameter of the smokebox does not affect the proper size of the stack except as it affects L in the formula $D = .49N\sqrt{L}$ L. W. E. JOHNSTON.

INCONVENIENT TICKETS.

BOSTON, MASS., Dec. 12, 1910.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

A perusal of the letters which you have recently published under the head "Friendly Criticisms of Railways," etc., leads me to write in regard to a few things that are annoying, and, so far as I am able to see, without reason.

Some time ago the fare between Boston and Portland was $2.30, and recently it has been raised to $2.50, to which I make no objection; but you are now compelled to buy a ticket of three or four times the size of the regular ticket, on which it says, "in consideration of the reduced fare at which this ticket is sold," etc., etc. Inasmuch as the fare has been increased it would seem as if there were a little sarcasm in this wording Furthermore we are now compelled to buy this ticket on the day it is to be used. A few days ago a friend of mine had

such a ticket that he had bought some time previously, and the conductor refused to take it. It seems to me that this is the height of absurdity and a useless annoyance to passengers. A ticket is merely a certificate that a certain sum of money has been paid for a certain thing, and it should be taken for that, no matter when it was purchased. One would think from the wording on this ticket that there was some other kind of a ticket that was sold at a higher price, but I believe there is no higher priced ticket; the wording is obsolete.

There is another annoyance which I see no reason for, though it is one of long standing. When a parlor-car ticket is purchased in some offices it is necessary for the passage ticket to be procured beforehand. In other offices this is not necessary, and it seems to me an absurd requirement and one that is annoying. A person may go to the parlor car office thoughtlessly before purchasing his transportation ticket, and then finds that he must go first to the other window. There he may find a long line of people waiting. This rule should be done away with.

Recently I was annoyed in New York. I attended the meeting of the American Society of Mechanical Engineers and used a certificate. I went to the Grand Central station to get a ticket to Boston on the day before coming and was informed that they could not issue the ticket until the next day. There happened to be nobody at the window and nobody would have been kept waiting. It is quite a long process to get a ticket with a certificate, inasmuch as one has to sign his name, and various extra things are done by the ticket seller. The next day, when I was able to get my ticket, I kept a lot of people waiting and they became all out of patience. This I regard as entirely unnecessary and a great nuisance. In connection with certificates I do not see any reason why it should be necessary to pay 25 cents when you pass in the certificate for validation.

Still another annoyance: the New York Central Lines have recently issued an order, which is being carried out on the Boston & Albany, that a ticket reading in one direction cannot be used in the other. They have objected to taking such tickets from me and refused to take such a ticket from a lady of my acquaintance whose husband had bought her two tickets reading one way in order to save her the trouble of purchasing a return ticket. If there is one thing that has been well established it is that a ticket reading in one direction is good in the opposite direction. The New Haven road prints on its local tickets that they are good in either direction, and this ought to be on all railway tickets. I am inclined to think that if this Boston & Albany matter was brought to the attention to the Massachusetts Railroad Commissioners they would make short work of it.

Such annoyances as these are among the things that cause people to be down on the railways. I am friendly to the railways, but I am nevertheless annoyed by many of their useless rules.

F. W. DEAN.

[We, like our correspondent, think that railways often make rules which do more harm than good. To prevent being cheated by dishonest passengers it is necessary sometimes to impose regulations which are decidedly inconvenient to the honest ones; but from long-continued custom this method of protecting revenue has in many cases been carried to absurd extremes. For the benefit of our correspondent, we can explain some of the things that he complains of, though it is doubtful if there is any valid defense for them. A limited ticket is advantageous to the railway in that it obviates the necessity of keeping the accounts open a long time to check the use of tickets which the buyers keep in their pockets perhaps for weeks. Theoretically there is, probably, a ticket sold at a higher price between Boston and Portland, but, as our correspondent suggests, it is quite likely that the legitimate reason for the two rates over such a short distance has long since vanished and the present inconvenience to the passengers is no doubt much greater than the convenience to the railway company. If a limit is reasonable it is not necessary to allege a reduction in the price of the ticket as the reason for the limitation. The habit of limiting tickets persists with the passenger men, because they need a limit on short-trip local tickets to prevent a dishonest conductor from stealing them and selling them to persons who can make money by having them used a second time. This would be unnecessary if our railways could devise some way to have passengers always surrender their tickets on entering trains, for then it would be possible to have a complete audit and do away with the present loose practice of having conductors hunt up passengers with tickets while the train is running from station to station. In every case, however, where railways have tried this reform they have been obliged, we believe, to give it up. The traveling public will not cheerfully put up with the delay and inconvenience of paying as they enter. The rule is now working successfully on street cars, and we believe could be modified so as to be workable on heavy local trains, where necessary; but no one has yet elaborated a satisfactory plan. The present custom is of 75 years' standing, but it must be admitted that it is the most unbusinesslike custom in the railway business. The requirement that a passenger buying a ticket at the Pullman office shall show his railway transportation was adopted to prevent mistakes. It is no doubt true that, without the rule, mistakes would occur; but in all probability the correction of these mistakes would be a small burden as compared with the inconvenience imposed upon passengers by the present plan. The "certificate plan" of issuing tickets to conventions was adopted to prevent the use of convention tickets by passengers not attending the convention, but we have no doubt that the railways would make just as satisfactory profits under a simple regulation to have tickets endorsed by the secretary of the convention. Any organization which had an unbusinesslike secretary, or which abused the privilege seriously, could be refused the privilege a second time. As to requiring local tickets to be used in only one direction, it is a convenience in the auditing department to know in which direction a ticket is used, but in view of the convenience afforded to passengers by the freedom enjoyed on the New Haven road we should think that any traffic manager would himself make short work of the restrictive rule without waiting for a state railway commission to act in the matter. As to the inconvenience of using a ticket which is four times the size of a local ticket, we think our correspondent ought to be thankful that he does not have to use one ten times as large as the small tickets—as passengers often do.—Editor.]

The discussion of extending Jamaica's railway system by building branch lines brings out some interesting facts. Of the 184 miles of railway now in operation, the main lines being from Kingston via Spanish Town to Montego Bay and from Spanish Town to Port Antonio, 120 miles were built between 1890 and 1896 by an American syndicate which had acquired from the Jamaican government the 64 miles already in operation. When this syndicate defaulted in payment of interest on its indebtedness in 1900 the government took over the lines with obligations amounting in round numbers to $11,500,000. In operating these lines an annual deficit of about $340,000 is incurred, from which the sum of $121,662, set aside annually as a sinking fund, must be deducted to obtain the net annual deficit. As the sinking fund now amounts to nearly $1,300,000, it is estimated that after thirty years the railway debt will be entirely paid off. The increased prosperity of the island, from the wonderful extension of its fruit trade, which is largely promoted by the railways, more than offsets the deficit incurred in operating the lines. The fruit business, which was only $15,000 in 1869 and $350,000 in 1879, increased to $1,500,000 in 1889, to $4,000,000 in 1899, and to $7,500,000 in 1909. The shipments of fruit, chiefly bananas, to the United States last year from the consular district, embracing Port Antonio and Port Maria, amounted to $3,243,896. Although the railways are operated at a loss, they contribute so largely to the promotion of the general business of the colony that the advocates of the building of branch lines contend that the general benefits will far outweigh any small deficit likely to be incurred in operating such extensions.

STUDIES IN RAILWAY ECONOMICS.

BY W. M. ACWORTH.

II.

I start, then, from the point that all railways alike, whether they be in state or in private hands, must base their rates on what the traffic will bear. Now, what the traffic will bear is not an abstract formula to be arrived at on theoretic considerations, but an actual figure to be worked out in each individual case by careful and detailed examination of special and individual facts. If this be accepted as a starting point, and if it be accepted further that rate making is the essential crux of railway management, much follows.[3] It may be said: rate making, though most important, is not all important. True, there is the question of what may be called broadly, facilities. But after all facilities are very much a question of price. We can all have express service on the humblest branch line, if we choose to pay for a special train; and the German railways will carry goods at English speed, provided the consignor will pay *Eilgut* rate, which is four times that of the normal tariff. Then there are the departments of railroading that come under the head of engineering and operating. But no one will contend that the testing of steel, or the tamping of sleepers, or the firing of an engine is essentially different according as the railway is publicly or privately managed.

On the whole it seems to me clear that, as an abstract question, state management or private management must stand or fall on the consideration of which of the two systems is likely best to adjust rates to what the traffic can bear.[4] Now it is evident that, from the point of view of rate fixing and tariff making the ideal manager (it is convenient to personify under this name the whole organization concerned with the matter) must possess certain characteristics. He must possess knowledge, not to say omniscience. He must know intimately the geographical and economic situation, not only of the whole territory directly tributary to his line, but also of all the adjoining territory that can indirectly be laid under contribution, or that enters into competition with it actually or potentially. The sources of his traffic, not only actual but potential, the points of distribution, and the points of ultimate destination must all be familiar to him. He must have an intimate acquaintance with the nature of every article known to commerce, its value, its bulk in relation to value, the extent to which other articles, quite different possibly in bulk and value, can be substituted for it. He must have present in his mind the possibility of slow or rapid increase[5] of production and consumption. And so on, and so on.

So far, there is once more nothing to choose between a state and a private undertaking. Walking encyclopædias are none too common on either side. But, given omniscience as near as we can get it, in the second place we must demand that the manager shall be impartial. In other words, when he makes a tariff, he must fix his mind solely on the consideration of what the traffic will bear, and be free to disregard entirely the pressure of any outside consideration. He has to raise his revenue by apportioning equitably the burden over the whole traffic, and he must constantly bear in mind that, if one category of traffic escapes its fair share of the burden, either the necessary net revenue falls short (what the necessary net revenue is we must consider later), or the rest of the traffic has to pay more than a fair share.

The legal procedure of a civilized country is the outcome of two thousand years of development. When we seek to obtain justice between man and man, how do we set about it? We choose a man of high character and keen intellect, who has spent his life in learning the general principles of law. We take security that he is personally quite disinterested in the matter in dispute. We protect him in every possible way from pressure by the friends of the parties to the dispute. We arrange that these parties shall have every opportunity to put before him their side of the case, both with reference to the law and with reference to the facts, and then we leave him to give his judgment publicly, with the reasons for or against it, with full confidence that it will be given with intelligence and in good faith. And when it is given we enforce it without hesitation with all the powers of the state. But, as the best of men is but man at the best, we recognize that he may go wrong, and, accordingly, we provide for an appeal, possibly even for a further appeal. But when the judgment of the court of final appear is given, though we recognize in full that it may be wrong, we also recognize that in the old Roman phrase it is to the interests of the state that there should be an end of disputes; and the final judgment stands, and the parties have to order themselves accordingly. Now, as it seems to me, there is a real analogy here to the business of rate fixing. The analogy is not perfect, for economic rights are seldom as capable of as precise ascertainment and definition as legal rights; but it is real; and the requirements, therefore, are much the same in the two cases. To fix rates, we want the best expert available. We need to secure his impartiality and his freedom from outside influence, and then we must accept his decision, abide by it, and enforce it.

Now we agreed that expert knowledge was just as likely to be found in a state official as in the manager of a private company. But from whom are we most likely to secure our second desideratum, impartiality undisturbed by outside influence? Consideration of the normal organization of a private company and of a state undertaking will enable us to supply the answer. Take first the company. The manager of a private company is responsible to a board of directors who represent the shareholders, being, indeed, frequently large shareholders themselves. Their interest is—indeed it is a common reproach made against them—the dividend, and nothing but the dividend. We may assume that, being ordinary human beings and disliking unnecessary friction, they will sympathize with Turgot's theory that in levying contributions it is desirable to pluck the maximum of feathers from the goose with the minimum of squawking. In other words, their natural tendency will be to support their manager in refusing to shear any individual lamb too close and in getting as much wool as possible from the lamb that can afford to lose it without making it suffer so much that its bleatings will be audible.[6] In the essential position of manager, directors, and shareholders alike there is nothing to induce them unduly to prefer one locality to another, or one trade to another. In the interest of their own undertaking they will not kill a single goose that is either laying golden eggs at the moment, or is likely to begin to lay eggs in the future. Indeed, if they are intelligent, they will desire to multiply to the utmost possible extent the breed of golden-egg-laying geese. The individual trader at A will naturally object strongly to any adjustment of

[3] Theoretically, of course, the idea that each rate must be based on what the traffic can bear would imply a separate bargain for each separate consignment. The amount of wind the lamb can stand must depend upon the thickness of the lamb's coat, and the lamb's coat is changing in thickness all the time. But in practice it is only possible to deal with traffic in categories, and if a railway made too many categories it would waste half its income in ascertaining accurately the precise amount that each category could properly be called upon to pay. To give a homely example, English observers are sometimes tempted to believe that the trousers of every French infantry soldier are of the same length. If this be true, the reason is obvious, that adapting the length of each pair of trousers to the height of each soldier would cost more in adjustment and complications than the value of the cloth that would thereby be saved.

[4] I am, of course, aware that the question between State ownership and private ownership is often decided on quite other grounds. The Belgians and the Swiss, for instance, adopted State management because they feared the domination of foreign capital. The Australians because capital could only be obtained on the credit of the State. The Italians, as the only way of ending the inextricable tangle of relationship between the State and its lessees. The Germans [Bismarck originally intended the purchase of the North German railways to be carried out, not by the Kingdom of Prussia, but by the German Empire], partly for strategic reasons, partly in pursuit of a policy of unification. And so on. I am speaking in the text of the matter in the abstract, and apart from the particular local considerations of any particular nation.

[5] The Austrian State railway administration publishes for the use of its staff a dictionary giving in reference to each article in the classification some such information as I have suggested in the text as an essential part of the working equipment of the ideal manager.

[6] I must postpone for future consideration, but will not omit to notice the point that the commercial management will strive to get not merely a reasonable but an excessive dividend.

rates that may enable traders at B or at C to compete in a market where he has a monopoly. But the natural instinct of directors and shareholders will be to support their manager in over-riding this objection, an objection which it is commonly considered ought not in the public interest to prevail.

So much for commercial management. Now let us see how far impartiality is likely to be secured under a state railway system. At the head of the state railway system there must be in some shape or other a manager responsible to parliament. In other words, a person who is first and foremost a politician, and only in the second place a railway man. Is it reasonable to expect impartiality from a manager of railways with a seat in parliament, a member of a government whose life may come to a sudden end any day unless some important town, or some important trade can be, in American phrase, "placated"?[7]

One of the cardinal doctrines of the old Manchester school used to be that in some mysterious, and, as far as I know, entirely unexplained, way, the purely selfish interest of each individual member of the community coincided with the general interest of the whole. If I may venture to criticise the conclusions of colleagues, for each of whom individually I have the utmost respect, it appears to me that the Majority Report of the recent commission on Irish Railways rests upon a somewhat similar fallacy—for fallacy it seems to me undoubtedly to be. In that report it is proposed that the Irish railways shall be managed by a body of delegates elected from the several provinces of Ireland. I am unable to understand how the efforts of Ulster and Leinster and Connaught and Munster, each to get somewhat more than their fair share at the expense of the others, would work out into a consistent policy for the benefit of Ireland as a whole. If the railways of a country are to be managed in the interests of the country as a whole, it seems to me quite indefensible to entrench men elected for the express purpose of representing sectional interest in the seat of government.

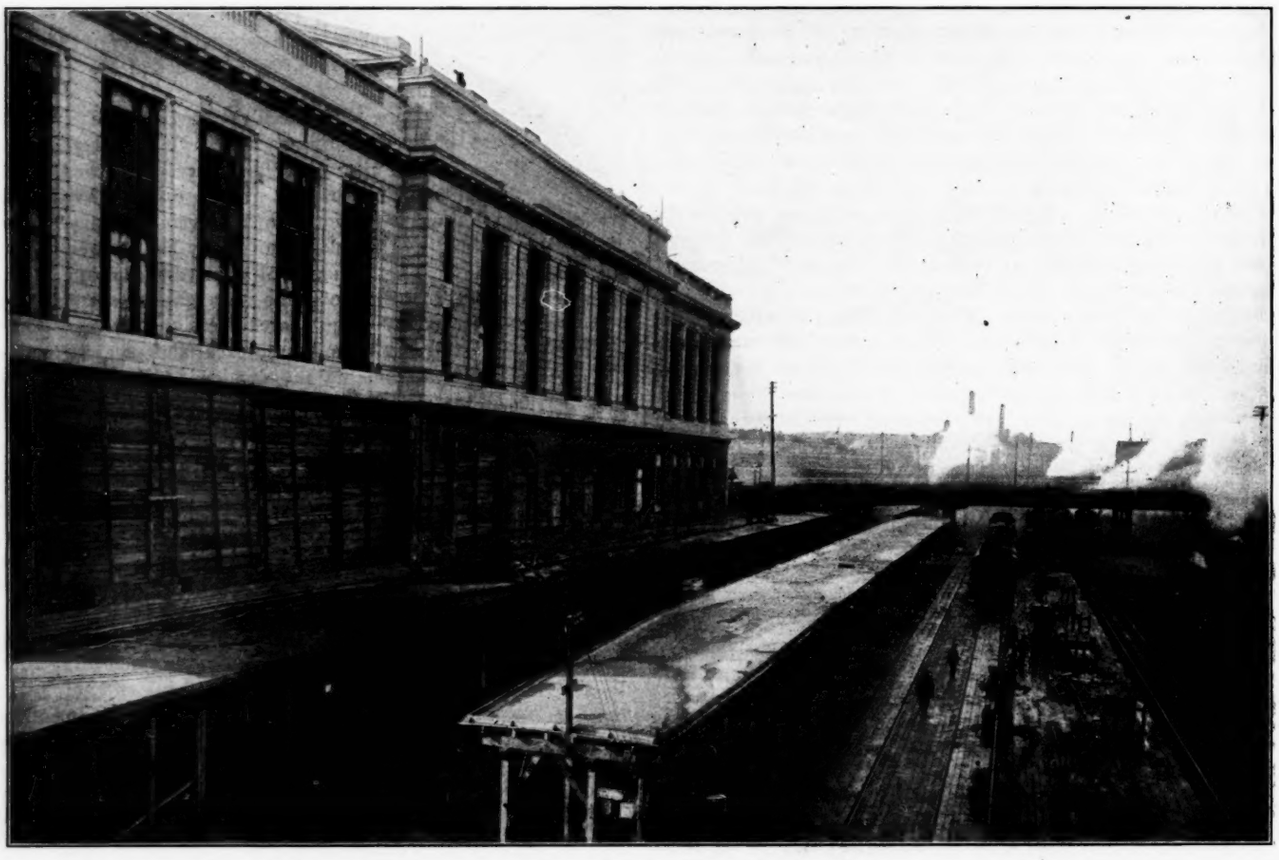
I sum up my argument as far as it has gone as follows: The fundamental difficulty of railroading is the making of rates. The making of rates in the interest of the whole country requires two qualities in the highest degree: expert knowledge and impartiality; and whereas expert knowledge is equally attainable under both systems, impartiality is much more likely to be attained under a system of private ownership. We have now to consider whether private ownership implies any countervailing drawbacks.

[7] It will be said, no doubt, that the state railway management of Germany is above suspicion of partiality. I question whether the same thing would be said with much confidence of state management in any other country, unless perhaps India, and in both cases the reason is the same. The manager is not responsible to a popular legislature, and is, therefore, not amenable to political pressure. I would invite those persons who believe that impartiality is possible with State management in a democratic country, to study the history of Australasian railways, which is one long story of attempts, more or less successful from time to time, and for a time, to protect the railways against the politicians.

BUSH TRAIN SHED AT BALTIMORE.

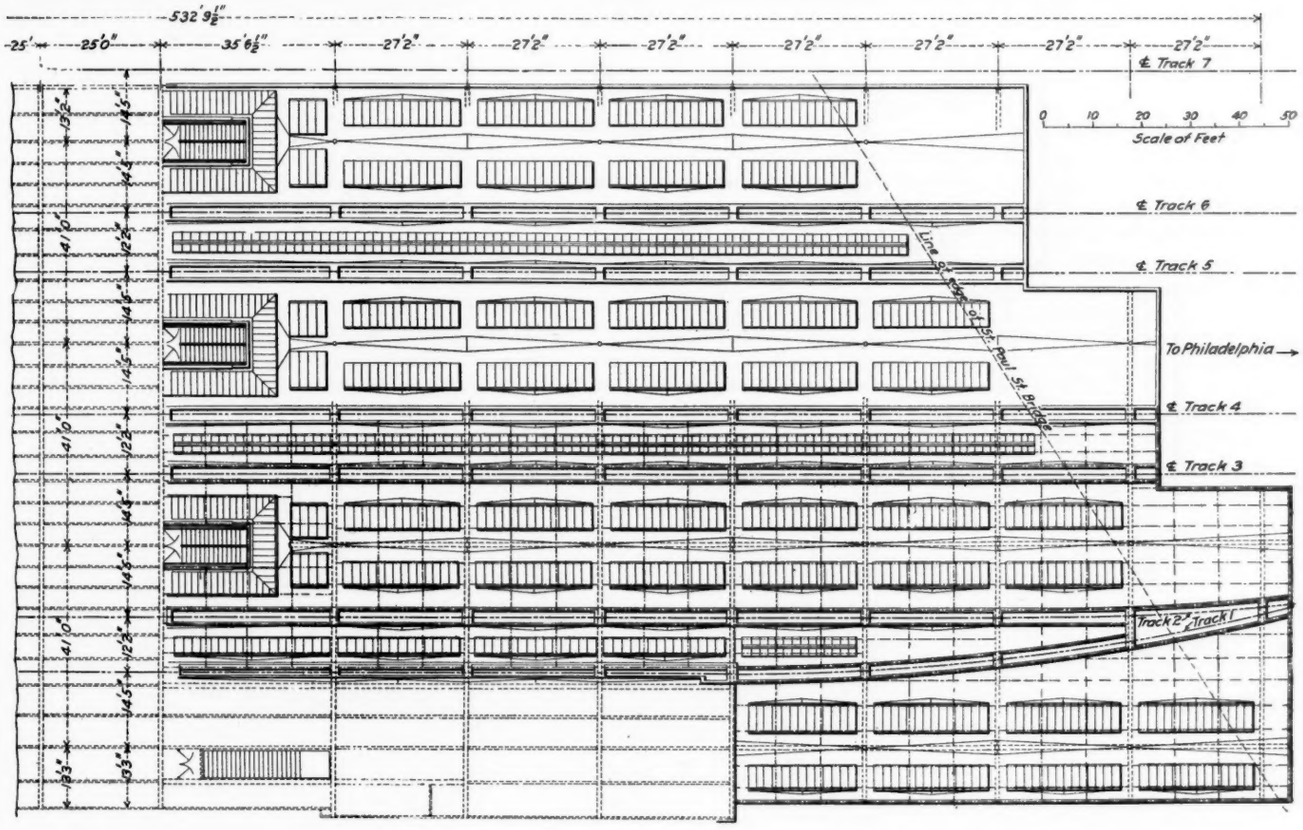
The new station which the Northern Central, a subsidiary of the Pennsylvania Railroad, is building at Baltimore was described in the *Railway Age Gazette* of November 12, 1909, page 928. The station tracks will be protected with the Bush train shed, installations of which at Hoboken, N. J., Scranton, Pa., and Chicago have been described in these columns.

The installation is novel in that it is the first Bush train shed to be put over depressed tracks. The station is between Charles and St. Paul streets, the main waiting room being at the street level and the tracks being 18 ft. below. A covered lobby, 330 ft. long, extends along the track side of the station from the bridge which carries Charles street over the tracks; and an enclosed lobby, 50 ft. wide, extends across the seven passenger tracks from a point at the middle of the station. The accompanying plan shows half of the platform layout, being the portion from this transverse lobby or passenger bridge to St.

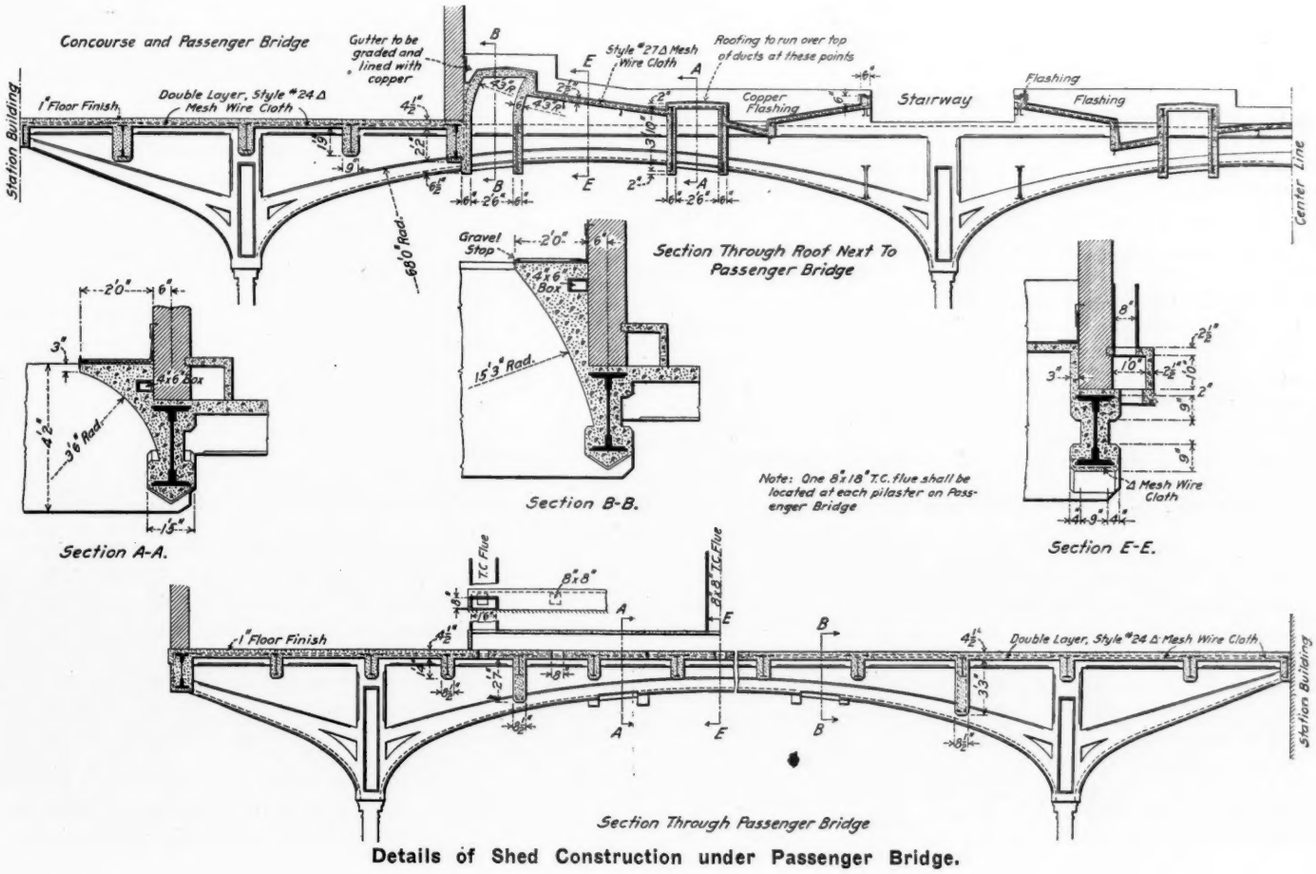


New Station at Baltimore and Site of Train Shed, Looking Toward Charles Street.

The passenger bridge is not yet built, and the wooden sheds are temporary.



Half Plan of Train Shed.

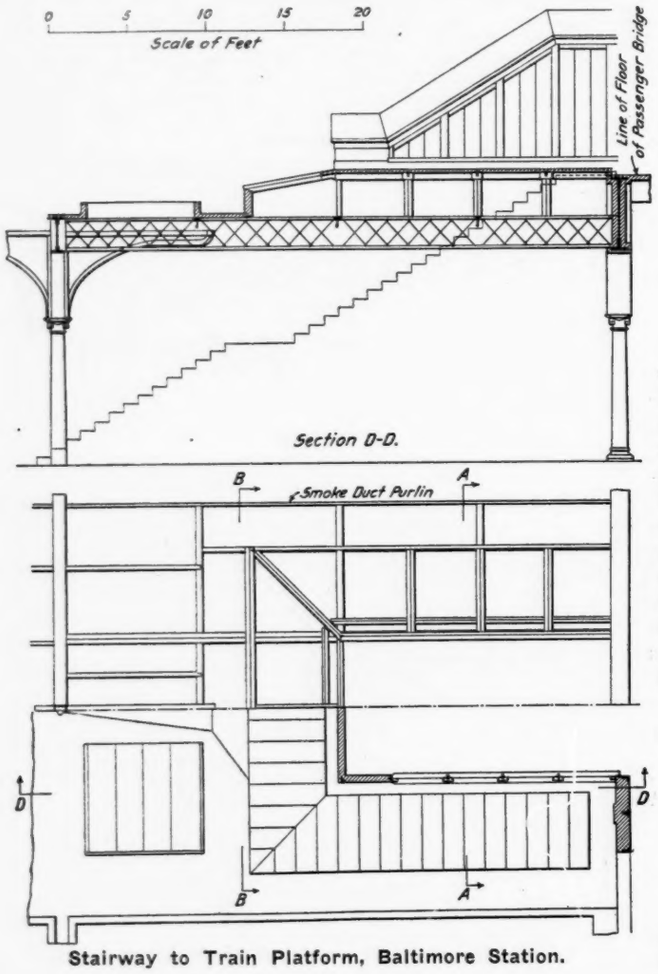


Details of Shed Construction under Passenger Bridge.

Paul street. The photograph shows the site of the shed. The total length of each platform is about 530 ft.

Covered stairways connect the passenger bridge with each train platform. One of the stairways is shown in the accompanying detail drawing. It will be noted that special provision is made for giving ample light at the stairways. A skylight runs around the three sides and the purlin at the inner edge of this skylight is a lattice girder instead of a web girder, so as to shut off the minimum amount of light.

The most interesting problem arising in the design was the taking care of smoke under the passenger bridge. The design of the smoke ducts between bridges is similar to those in previous installations. The under side of the passenger bridge, being flat and divided by floor beams parallel to the track, made a series of pockets for smoke to collect, each of which had to be drained of smoke. The accompanying details show a section through the passenger bridge and a section through the shed next

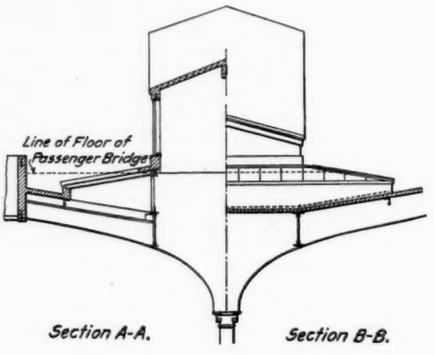


Stairway to Train Platform, Baltimore Station.

to the passenger bridge, showing the connection of the smoke ducts with the side walls of the bridge and with the concourse already mentioned, which connects with the passenger bridge. The sides of the smoke duct run alongside of the concourse and are turned outward to deflect the smoke away from the walls of the concourse. As shown in sections A-A and B-B, smoke rising through this duct and the ducts over the other tracks is also deflected out from the wall of the passenger bridge, at the points where they connect with the bridge. The section through the passenger bridge shows how the smoke under it is taken care of. The concrete encasing the floor beam just outside the center line of the track is carried down to a greater depth. Each of the five pockets thus left between the floor beams over the two tracks is pierced with 8 in. flues, which open into a 12-in. horizontal duct from which vertical flues are carried up alongside of the inner faces of the walls of the passenger bridge, as shown in the section through the passenger bridge, and in section E-E. The pockets just outside (that is, toward the center of the platform) of the deepened floor beams are also provided with flues, as some smoke and gases may get beyond these beams.

The roof of the shed is not connected to the street bridges, but is simply carried up to them, running only as far as the sidewalk girder of the Charles street bridge, and extending 20 or 30 ft. under the St. Paul street bridge. These bridges are askew, and the line of the edge of the St. Paul street bridge is indicated on the plan by the dotted line at the right hand side of the drawing, there being no skylights under the bridge.

The roof of the shed is drained by down-drain pipes inside of every other column. The details of these drains differ somewhat from previous sheds. There is a cast-iron screen over each



drain-pipe which is easily lifted out so that it and the drain-pipe can be cleaned. The 5-in. drain-pipe down through the column (the inside diameter of the cast iron column is 5 in.), is threaded into the cast socket in which the screen rests, and also into a plate at the foot of the column. These joints are made water-tight, so that no water can get in the annular space between the drain-pipe and the inside of the column. From the foot of the column the water is carried to a small catch basin; there being one of these basins on the center line of the platform at each column which carries drainage. The basin is covered with a manhole at platform level to give access to it. From the catch basin a drain connects to the city sewers.

The train shed will be erected under traffic. This design of shed is patented by Lincoln Bush, New York.

COST OF TRACK LAYING.

BY H. C. LANDON,

Division Engineer, Erie Railroad, Hornell, N. Y.

In connection with a recent article [*Railway Age Gazette*, June 3, 1910], on cost of track laying with modern track laying machinery, the cost and progress of track laying by the old methods may be interesting.

In 1905 and 1906, while engineer of maintenance of way of the Buffalo & Susquehanna, I was in direct charge of all track laying, ballasting, etc., between Wellsville and Buffalo, and had, in fact, previous to this time, had charge of all the track laying of the B. & S. from 1898, about 110 miles in all. I have not got the data of the cost of this work, except that, with the low price of labor, the cost, including labor, rental of engines, cars, etc., did not exceed $275 per mile. As much as 5,700 ft. of track has been laid in a single day, with about 65 men, through the winding valleys of the branches of the Susquehanna river south of Wharton, Pa.; and the average kept up very close to a mile a day where any considerable grade was ready ahead of the track layers.

On the line between Wellsville and Buffalo there were a large

number of bridges to be constructed as the track laying advanced; the steel for the bridges was brought over the new line, so that the track layers hardly became organized for rapid work before they were stopped for a period of two or three days to two months while the new structures were being erected. During this period, of course, the track layers were ballasting the new tracks or engaged in completing unfinished track on troublesome fills. The laborers, especially the spikers and members of the iron gang, had had previous experience and had, in general, become quite expert.

About one-third of the men were Hungarians and the balance Italians. No natives were employed. While at first the Slavs were decidedly the better laborers, some of the Italians became expert in spiking and in handling the rail so that spike gangs and iron gangs were made up of Italians and Hungarians, making a rivalry which expedited the work considerably.

Two truck gangs were always employed, passing each other by using a portable turntable or by lifting the heavy truck body from the wheels.

Good camp cars and a well equipped blacksmith car were provided. A combined gasolene engine and pump and a tank of about 10,000 gals. capacity, which could be quickly taken down and erected, formed part of the equipment, so that the track laying engine could be kept as close as possible to the work.

The longest stretch of grade which was ready for the track, and where no large bridges intervened to delay the work, was between Belvidere and Belfast and White Creek bridge, and on this stretch the track laying gangs showed what they could do when the organization was well in hand. This work, of course, does not in any way compare with some feats in the West over level country; but among winding roads of the East it does compare very favorably.

The biggest day's work on this stretch was 5,000 ft. on May 30, 1905, and the average for the six miles was 4,600 ft. a day. On July 2, 1905, north of White Creek bridge, 5,900 ft. was laid in one day near Belfast, including delay of several hours placing a small bridge at Transit bridge. The average for this one gang during the time employed was about 4,400 ft. a day. Other smaller gangs were employed out of Arcade and Hamburg working north and south to reach important large structures nearby, and, while these did not accomplish so much in a single day, their average was about 50 ft. per man.

The track laying gang was made up about as follows:

1 Foreman	$4.00	per	day	$4.00
2 Assistant foremen	3.00	"	"	6.00
12 Spikers and nippers	1.50	"	"	18.00
36 Trackmen	1.50	"	"	54.00
2 Tie tiers	1.50	"	"	3.00
2 Tie spacers	1.50	"	"	3.00
1 Spike puller	1.50	"	"	1.50
4 Bolters	1.50	"	"	6.00
2 Rail unloaders	1.50	"	"	3.00
4 Tie unloaders	1.50	"	"	6.00
1 Water boy	1.25	"	"	1.25
Total				$105.75

Behind the supply train, full tieing:

1 Foreman	$3.00	"	"	$3.00
24 Laborers	1.50	"	"	36.00
1 Timekeeper	2.00	"	"	2.00
Total				$41.00

At storage yard, loading rail and ties:

1 Foreman	$3.00	"	"	$3.00
24 Laborers	1.50	"	"	36.00
1 Engine and crew	40.00	"	"	40.00
Total				$79.00
Total, in all				$225.75

The average amount of track laid per day was over 4,000 ft. At 4,000 ft. a day the cost per mile would be $297.97. As much material was received while the track laying was in progress, the expense of rehandling in the supply yard was avoided.

The auditor's books, when rail laying was completed between Wellsville and Buffalo, indicated that the entire cost for laying 98.1 miles of track was $29,515.45, or $300.85 a mile. Of this 98.1 miles of track, 85 miles was main track and the balance sidings, Y tracks, and passing tracks.

The labor cost included building turnouts, etc. This is the total cost of labor, including engine and train crew, fuel, supplies, and rental of engine, and cost of office force. All rail laid was 80-lb. A. S. C. E. section.

There is no question but that ordinarily, where there is sufficient track building in sight, an efficient track laying machine, together with an efficient organization, will effect considerable economy and aid in completing the work in a shorter time, but the grade and smaller structures should be ready so that the track building can be continuous. With a good track laying machine, moderate curvature and light grades, very much more than a mile of track a day should be accomplished. If the structures are close together and track cannot be laid in any considerable stretches at a time, a well organized gang of good laborers will be as effective.

THE INITIAL CARRIER'S LIABILITY.

The United States Supreme Court in the case of the Atlantic Coast Line Railroad Plaintiff in Error v. Riverside Mills sustained the decision of the lower court in holding the initial carrier liable for damages occuring off its own lines. An abstract of the opinion follows:

This was an action to recover the value of goods received by the Atlantic Coast Line Railroad at a point on its line in the state of Georgia for transportation to points in other states. The agreed statement of facts showed that the goods were safely delivered by the Atlantic Coast Line Railroad to connecting carriers, and were lost while in the care of such carriers, and the question is whether the initial carrier is liable for such loss.

The stipulated facts showed that the goods were tendered to the Atlantic Coast Line Railroad and through bills of lading were issued. * * *

On the reverse side of the bill of lading were certain conditions, one of which was that "No carrier shall be liable for loss or damage not occurring on its portion of the route."

The court below, on this state of facts, instructed a verdict for the plaintiff [Riverside Mills] on which there was judgment for the amount of the verdict, and, upon motion of the plaintiff, an attorney's fee of $100 was ordered to be taxed as part of the costs in the case. Thereupon error was assigned, and this writ of error sued out by the railway company.

After making the above statement, Mr. Justice Lurton delivered the opinion of the court:

The goods of the defendants in error were lost by a connecting carrier to whom they had been safely delivered. Though received for a point beyond its own line and for a point on the line of a succeeding carrier, there was no agreement for their safe carriage beyond the line of the plaintiff in error, but, upon the contrary, an express agreement that the initial carrier should not be liable for "a loss or damage not occurring on its own portion of the route." Such a provision is not a contract for exemption from a carrier's liability as such, but a provision making plain that it did not assume the obligation of a carrier beyond its own line, and that each succeeding carrier in the route was but the agent of the shipper for a continuance of the transportation. It is therefore obvious that at the common law an initial carrier under such a state of facts would not be liable for a loss through the fault of a connecting carrier to whom it had, in due course, safely delivered the goods for further transportation. Liability is confessedly dependent on the provision of the act of Congress regulating commerce between the states known as the Carmack amendment of January 29, 1906. The twentieth section of the act of February 4, 1887, as changed by the Carmack amendment, reads as follows:

"That any common carrier, railway, or transportation company receiving property for transportation from a point in one state to a point in another state shall issue a receipt or bill of lading

therefor, and shall be liable to the lawful holder thereof for any loss, damage, or injury to such property caused by it or by any common carrier, railway or transportation company to which such property may be delivered or over whose line or lines such property may pass, and no contract, receipt, rule or regulation shall exempt such common carrier, railway, or transportation company from the liability hereby imposed. Provided, that nothing in this section shall deprive any holder of such receipt or bill of lading of any remedy or right of action which he has under existing law.

"That the common carrier, railway or transportation company issuing such receipt or bill of lading shall be entitled to recover from the common carrier, railway, or transportation company on whose line the loss, damage or injury shall have been sustained the amount of such loss, damage, or injury as it may be required to pay to the owners of such property, as may be evidenced by any receipt, judgment, or transcript thereof."

The power of Congress to enact this legislation has been denied, first, because it is said to deprive the carrier and the shipper of their common law power to make a just and reasonable contract in respect to good to be carried to points beyond the line of interstate carrier; and, second, that in casting liability upon the initial carrier for loss or damage upon the line of a connecting carrier the former is deprived of its property without due process of law. * * *

The general doctrine accepted by this court, in the absence of legislation, is, that a carrier, unless there be a special contract, is only bound to carry over its own line and then deliver to a connecting carrier. That such an initial carrier might contract to carry over the whole route was never doubted. It is equally indisputable that if it does so contract, its common law carrier liability will extend over the entire route.

The English cases beginning with *Muschamp* v. *Lancaster Railway Company,* decided in 1841, down to *Bristol etc. Railway* v. *Collins,* have consistently held that the mere receipt of property for transportation to a point beyond the line of the receiving carrier, without any qualifying agreement, justified an inference of an agreement for through transportation and an assumption of full carrier liability by the primary carrier. The ruling is grounded upon considerations of public policy and public convenience, and classes the receipt of goods so designated for a point beyond the carrier line as a holding out to the public that the carrier has made its own arrangements for the continuance by a connecting carrier of the transportation after the goods leave its own line. There are American cases which take the same view of the question of evidence thus presented.

Upon the other hand, many American courts have repudiated the English rule which holds the carrier to a contract for transportation over the whole route, in the absence of a contract clearly otherwise, and have adopted the rule that unless the carrier specifically agrees to carry over the whole route its responsibility, as a carrier, ends with its own line, and that for the continuance of the shipment its liability is only that of a forwarder. The conflict has, therefore, been one as to the evidence from which a contract for through carriage to a place beyond the line of the receiving carrier might be inferred.

In this conflicting condition of the decisions as to the circumstances from which an agreement for through transportation of property designated to a point beyond the receiving carrier's line might be inferred, Congress by the act here involved has declared, in substance, that the act of receiving property for transportation to a point in another state and beyond the line of the receiving carrier shall impose on such receiving carrier the obligation of through transportation with carrier liability throughout. But this uncertainty of the nature and extent of the liability of a carrier receiving goods destined to a point beyond its own line was not all which might well induce the interposition of the regulating power of Congress. Nothing has perhaps contributed more to the wealth and prosperity of the country than the almost universal practice of transportation companies to cooperate in making through routes and joint rates. Through this method a situation has been brought about by which, though independently managed, connecting carriers become in effect one system. This practice has its origin in the mutual interests of such companies and in the necessities of an expanding commerce. * * *

Along with this singleness of rate and continuity of carriage there grew up the practice by receiving carriers, illustrated in this case, of refusing to make a specific agreement to transport to points beyond its own line, whereby the connecting carrier for the purpose of carriage would become the agent of the primary carrier. The common form of receipt, as the court may judicially know, is one by which the shipper is compelled to make with each carrier in the route over which his package must go a separate agreement limiting the carrier liability of each separate company to its own part of the through route. As a result the shipper could look only on the initial carrier for recompense for loss, damage or delay occurring on its part of the route. If such primary carrier was able to show a delivery to the rails of the next succeeding carrier, although the packages might and usually did continue the journey in the same car in which they had been originally loaded, the shipper must fail in his suit. He might, it is true, then bring his action against the carrier so shown to have next received the shipment. But here, in turn, he might be met by proof of safe delivery to a third separate carrier. In short, as the shipper was not himself in possession of the information as to when and where his property had been lost or damaged and had no access to the records of the connecting carriers who, in turn, had participated in some part of the transportation, he was compelled in many instances to make such settlement as should be proposed.

This burdensome situation of the shipping public in reference to interstate shipments over routes including separate lines of carriers was the matter which Congress undertook to regulate.

It must be conceded that the effect of the act in respect of carriers receiving packages in one state for a point in another and beyond its own lines, is to deny to such an initial carrier the former right to make a contract limiting liability to its own line. This it is said is a denial of the liberty of contract secured by the Fifth Amendment to the Constitution.

This power to regulate is the right to prescribe the rules under which such commerce may be conducted. "It is," said Chief Justice Marshall, in *Gibbons* v. *Ogden,* "a power vested in Congress as absolutely as it would be in a single government having in its constitution the same restrictions on the exercise of the power as are found in the Constitution of the United States." It is a power which extends to the regulation of the appliances and machinery and agencies by which such commerce is conducted. Thus, in *Johnson* v. *Southern Pac. Ry.,* 196 U. S., 1, an act prescribing safety appliances was upheld. And in *Interstate Commerce Commission* v. *Illinois Central R. R. Co.,* 215 U. S., 452, it was held that the equipment of an interstate railway, including cars used for the transportation of its own fuel, was subject to the regulation of Congress. * * *

It is obvious, from the many decisions of this court, that there is no such thing as absolute freedom of contract. Contracts which contravene public policy cannot be lawfully made at all, and the power to make contracts may in all cases be regulated as to form, evidence, and validity as to third persons. The power of government extends to the denial of liberty of contract to the extent of forbidding or regulating every contract which is reasonably calculated to injuriously affect the public interests. Undoubtedly the United States is a government of limited and delegated powers, but in respect of those powers which have been expressly delegated, the power to regulate commerce between the states being one of them, the power is absolute, except as limited by other provisions of the Constitution itself.

Having the express power to make rules for the conduct of commerce among states, the range of congressional discretion as to the regulation best adapted to remedy a practice found inefficient or hurtful, is a wide one. If the regulating act be one directly applicable to such commerce, not obnoxious to any other

provision of the constitution, and reasonably adapted to the purpose by reason of legitimate relation between such commerce and the rule provided, the question of power is foreclosed. "The test of power," said Mr. Justice White, speaking for this court in the Employers' Liability Cases, cited above, "Is not merely the matter regulated, but whether the regulation is directly one of interstate commerce, or is embraced within the grant of power conferred on Congress to use all lawful means necessary and appropriate to the execution of the power to regulate commerce."

That a situation had come about which demanded regulation in the public interest was the judgment of Congress. The requirement that carriers who undertook to engage in interstate transportation, and as a part of that business held themselves out as receiving packages destined to places beyond their own terminal, should be required as a condition of continuing in that traffic to obligate themselves to carry to the point of designation, using the lines of connecting carriers as their own agencies, was not beyond the scope of the power of regulation. The rule is adapted to secure the rights of the shipper by securing unity of transportation with unity of responsibility. The regulation is one which also facilitates the remedy of one who sustains a loss, by localizing the responsible carrier. Neither does the regulation impose an unreasonable burden upon the receiving carrier. The methods in vogue, as the court may judicially know, embrace not only the voluntary arrangement of through routes and rates, but the collection of the single charge made by the carrier at one or the other end of the route. This involves frequent and prompt settlement of traffic balances. The routing in a measure depends upon the certainty and promptness of such traffic balance settlements, and such balances have been regarded as debts of a preferred character when there is a receivership. Again, the business association of such carriers affords to each facilities for locating primary responsibility as between themselves which the shipper cannot have. These well-known conditions afford a reasonable security to the receiving carrier for a reimbursement of a carrier liability which should fall upon one of the connecting carriers as between themselves.

But it is said that any security resulting from a voluntary agreement constituting a through route and rate is destroyed if the receiving carrier is not at liberty to select his own agencies for a continuance of the transportation beyond his own line. This is an objection which has no application to the present case. This action was for loss and damage arising from several distinct shipments to different places beyond the line of the plaintiff in error who was the initial or receiving carrier. The presumption from the absence of anything to the contrary in the record is that the routing was over connecting lines with whom the plaintiff in error had theretofore made its own arrangements and rate. This record presents no question as to the right of the initial carrier to refuse a shipment designated for a point beyond its own line, nor its right to refuse to make a through route or joint rate when such route and rate would involve the continuance of a transportation over independent lines. We, therefore, refrain from any consideration of the large question thus suggested. The shipments involved in the present case were voluntarily received by an initial carrier who undertook to escape carrier's liability beyond its own line by a provision limiting liability to loss upon its own line. This was forbidden by the Carmack amendment and any stipulation and condition in the special receipt which contravenes the rule in question is invalid.

Reduced to the final results, the Congress has said that a receiving carrier, in spite of any stipulation to the contrary, shall be deemed, when it receives property in one state to be transported to a point in another involving the use of a connecting carrier for some part of the way, to have adopted such other carrier as its agent, and to incur carrier liability throughout the entire route, with the right to reimbursement for a loss not due to his own negligence. The conditions which justified this extension of carrier liability we have already adverted to. The rule of the common law which treated a common carrier as an insurer grew out of a situation which required that kind of security for the protection of the public. To quote the quaint but expressive words of Lord Holt, in *Coggs* v. *Bernard,* when defending and applying the doctrine of absolute liability against loss not due to the act of God or the public enemy, "this rule," said he, "is a public establishment contrived by the policy of the law for the safety of all persons, the necessities of whose affairs oblige them to trust those sort of persons that they may be safe in their ways of dealing."

If it is to be assumed that the ultimate power exerted by Congress is that of compelling co-operation by connecting lines of independent carriers for purposes of interstate transportation, the power is still not beyond the regulating power of Congress, since without merging identity of separate lines of operation it stops with the requirement of oneness of charge, continuity of transportation and primary liability of the receiving carrier to the shipper, with the right of reimbursement from the guilty agency in the route. That there is some chance that this right of recoupment may not be always effective may be conceded without invalidating the regulation. If the power existed and the regulation is adapted to the purpose in view, the public advantage justifies the discretion exercised and upholds the legislation as within the limit of the grant conferred upon Congress. * * *

But it is said that the act violates the Fifth Amendment by taking the property of the initial carrier to pay the debt of an independent connecting carrier whose negligence may have been the sole cause of the loss. But this contention results from a surface reading of the act and misses the true basis upon which it rests. The liability of the receiving carrier which results in such a case is that of a principal for the negligence of his own agents.

In substance Congress has said to such carriers, "If you receive articles for transportation from a point in one state to a place in another, beyond your own terminal, you must do so under a contract to transport to the place designated. If you are obliged to use the services of independent carriers in the continuance of the transit, you must use them as your own agents and not as agents of the shipper." It is, therefore, not the case of making one pay the debt of another. The receiving carrier is, as principal, liable not only for its own negligence, but for that of any agency it may use, although, as between themselves, the company actually causing the loss may be primarily liable.

In *Seaboard Air Line* v. *Seegers,* 207 U. S. 73, 78, legislation by the State of Georgia imposing a penalty on common carriers for failure to adjust damage claims within forty days was held to neither deny due process nor the equal protection of the law. Speaking by Mr. Justice Brewer, the court said of the reasonableness of the requirement and classification, that "the matter to be adjusted is one peculiarly within the knowledge of the carrier. It receives the goods and has them in its custody until the carriage is completed. It knows what it received and what it delivered. It knows what injury was done during the shipment and how it was done. The consignee may not know what was in fact delivered at the time of the shipment, and the shipper may not know what was delivered to the consignees at the close of the transportation. The carrier can determine the amount of the loss more accurately and promptly and with less delay and expense than anyone else, and for the adjustment of loss or damage to shipments within the state forty days cannot be said to be an unreasonably short length of time."

The conclusion we reach in respect to the validity of the amendment has the support of some well-considered cases. Among them we cite: *Smeltzer* v. *Railroad,* 158 Fed. 649; *Railroad* v. *Mitchell,* 91 N. W. Rep., 735; *Railroad* v. *Scott,* 118 S. W. Rep., 992.

The judgment included an attorney's fee taxed as part of the costs. * * * The judgment was erroneous to this extent, and the provision for an attorney's fee is stricken out, and the judgment thus modified is affirmed.

ANNUAL REPORT OF NEW YORK STATE PUBLIC SERVICE COMMISSION, FIRST DISTRICT.

The New York State Public Service Commission for the first district (New York City), has issued advance sheets of the principal part of its annual report. The commission has held 134 formal and 185 informal meetings during the past year and has considered 2,711 matters (not including those relating to rapid transit) of which 194 were formal cases. Fifty-three of these formal cases remained undetermined at the end of the year. in the formal cases 527 hearings were held, generally before one commissioner. The report gives the number of formal cases in each of nine separate classes. The rules have been revised so that a larger proportion of the matters coming before the board are now dealt with informally. A large part—half a dozen pages—of the summary now issued deals with rapid transit. This subject, however, is made up almost wholly of a large number of unsettled questions, and this part of the report, therefore, consists mainly of data which will be of general interest only after the commission decides the important questions now before it relative to the authorization of new subway lines.

Statistics are given of the 75 companies under the jurisdiction of the commission—railways, street railways, gas and electric companies—including statistics of the business done by them during the past year, accompanied by comparisons with preceding years.

The question of securing adequate service on railways of the city during rush hours is referred to as a difficult one, and statistics are given of the rapid growth of the traffic on these lines. Comparison is made of the number of persons riding on surface, elevated and subway lines in the city, with the population of the city, and it appears that in 1898 the number of rides per capita was 228, while in the year 1910 it was 320. The commission is proceeding persistently in the cause to secure the forfeiture of the franchises under which are maintained about 25 miles of street railway track in the streets of the city, none of which is used. A suit against one company has already been successful, and in two or three other cases the companies have voluntarily agreed to take up the tracks; and the commission looks for the speedy removal of all abandoned tracks in the city.

Elimination and Protection of Grade Crossings.—There have been during the year 32 cases involving grade crossings in New York City. Of these cases, 12 were on motion of the commission for the elimination of 27 grade crossings; 4 on motion of the commission for additional safety precautions at 28 grade crossings; 2 on motion of the commission to restrict the operation by the New York Central of freight trains over the numerous crossings on Eleventh avenue, Manhattan; 1 upon complaint for additional protection of one grade crossing; 1 upon application of a company for the elimination of grade crossings which were already covered by a proceeding determined by the commission; 1 upon application of a company for eliminating one grade crossing by discontinuing it; 9 upon application of the city of New York to determine the manner of opening of new streets across railways, embracing 11 grade crossings, and 2 upon application of railways to cross existing railways, embracing 2 grade crossings.

The total number of grade crossings on steam railways in the city of New York is 494; of these 433 are the crossings of public streets across steam railways and 61 are private roads across steam railways. Ninety-eight crossings are on the New York Central in Manhattan, 223 on the Long Island in Brooklyn and Queens boroughs, and 85 on the Staten Island railway.

In the matter of protection, the 433 public crossings and 61 private crossings are grouped as follows:

Public Crossings.		*Private Crossings.*	
Protected by gates and flagmen	161	Protected by farm gates	12
Protected by flagmen only	71	Protected by bells	2
Protected by bells only	47	Protected by signs	32
Protected by bells and semaphores	3	No protection	15
Unprotected except by sign	151	Total	61
Total	433		

The number of accidents at grade crossings during the last three years were as follows:

1908—Killed, 21; injured, 41. 1909—Killed, 23; injured, 35. 1910—Killed, 16; injured, 32. Total—Killed, 60; injured, 108.

Two-thirds of the fatal accidents occurred on Long Island.

The commission has under way at the present time proceedings for the elimination of 20 grade crossings in the Borough of Queens (Long Island). The proceedings as to nine of these, located in Flushing, will cost $1,100,000. Formal determination as to these locations was made on December 31. To meet this cost there is an appropriation made by the legislature last year for use in Queens county of $200,000. The Long Island Railroad Company has agreed to bear the remaining cost of that elimination, estimated at $700,000. The remaining Queens proceedings before the commission involve the elimination of crossings, the estimated cost of which will be about $3,000,000. To meet the state's share of this expense, no appropriation has been made, but the commission has requested an appropriation by the coming legislature of $400,000 for use in Queens county.

The commission has under way at the present time proceedings for the elimination of seven grade crossings in the Borough of Richmond (Staten Island). The estimated cost of eliminating five of these is $200,000. The last session of the legislature appropriated $50,000 for use in Richmond and all of this will be necessary for the elimination of these five grade crossings. The city is to appropriate $50,000 as its share. The commission has asked the next session of the legislature to appropriate $50,000 for Richmond.

The commission is also asking for an appropriation from the next legislature of $50,000 for use in the elimination of grade crossings in Brooklyn, and $100,000 for Manhattan and the Bronx.

Although there are over 400 grade crossings in New York City, up to 1910, only $9,000 of state appropriation had been used in the city on elimination of grade crossings. In 1910 the legislature appropriated $250,000, and for 1911 this commission has requested, as stated above, $600,000. This amount is not for administrative expenses, but to help pay the cost of a substantial start in elimination in New York City of the grade crossings of steam railways, at which in three years 60 were killed and 108 injured.

SNOW SHEDS ON THE GREAT NORTHERN.

On March 1, 1910, a snow slide at Wellington, Wash., near the mouth of the Cascade tunnel, struck two trains and seven locomotives on the Great Northern, resulting in the loss of many lives and considerable property. Several similar disasters occurring about the same time on roads crossing the Western mountain ranges called renewed attention to the danger of travel during the winter months on roads in such locations. The only means of preventing such accidents on lines that must be located at the foot of steep snow-covered slopes is to build sheds over the tracks to carry slides safely across the right-of-way. Such sheds have been in service for many years on mountain roads, and in most cases have proved an efficient protection. They have usually been built of timber, but, in speaking of this practice, Committee No. IX of the American Railway Engineering and Maintenance of Way Association in its report to the 1909 convention, made the following recommendation:

"Snow sheds are expensive to construct and expensive to maintain, and the railway should be located, if possible, so as to prevent the necessity of their construction. Their use should be confined to localities which require protection from mountain snow slides, and then they should be constructed of more permanent material than is now ordinarily used."

Following the accidents of last winter, the Great Northern took immediate steps to further safeguard its line through the Cascade mountains, and this work of protection was considered of such great importance that the company has spent more than $1,500,000, and at the most dangerous point has had built a reinforced concrete shed which sets a new standard for this type of construction. The plans for this work were so satisfactory to the

state railway commission of Washington that it included in a recent report the following comment on the proposed concrete sheds:

"The proposed permanent construction of steel and concrete is a very high-grade example of modern building practice and the plans have been worked out sufficiently in detail so that, in our opinion, no question can be raised as to their strength and ability of the structures to meet any demand that may be made upon them. They will be fireproof and should last for generations, and that they will provide absolute safety from slides there is not the slightest question. Any railway track so protected is, in our opinion, as safe for travel as any stretch of equal length picked from the average of the total main track in the United States."

The concrete shed is at Wellington, where the most disastrous slide of last winter occurred. It is 870 ft. east of a long wooden shed, which was built several years ago, and as this open space is to be covered at once by a wooden shed, the track will be protected at this point by a continuous shed of wood and concrete for about 1½ miles. To provide additional space for tracks and to allow as much as possible of the concrete shed to be anchored to the solid rock, a lateral cut of about 50 ft. was made, involving some very heavy rock excavation. The method of anchoring to the rock is well illustrated in Figs. 1 and 2. The face of the rock cut varies from a vertical wall to an irregular slope, and the design of the retaining wall and anchoring was varied to meet these conditions. The cross section shown in Fig. 1 is that for locations where the roof of the shed forms a continuation of the natural slope, and no fill is required behind the retaining wall. Since the wall is not under earth pressure, it is made with a uniform thickness of 6 in. For the location shown in Fig. 2, where the retaining wall is backed by a solid rock face for only a portion of its height, an earth fill is required to make the surface slope continuous with the roof of the shed. In this case the wall thickness is made 7 in. at the top and increased ¼ in. per foot of height down to the top of the vertical rock face, and from that point down it is 6 in. as in the other design. Fig. 3 shows the cross section used in earth cuts, the footing being extended back 19 ft. so the weight of fill will provide stability against overturning. The wall is braced on the rear side by 10 in. buttresses spaced 10 ft. center to center. In this design the retaining wall is made 9 in. thick at the top and increased in thickness ¼ in. per foot of height, making it 17 in. thick at the top of footing.

The roof slab is 10 in. thick designed for a load of 1,100 lbs. per square foot, this value being assumed to allow ample strength to resist the impact of heavy stones and trees being carried down in snow slides. The roof is given a pitch of 1 to 5, and projects 3 ft. beyond the outer column to prevent the material in the slide dropping down and injuring the columns or footings. The roof slab is supported on transverse beams 24 in. wide and 39 in. deep, the depth including the thickness of the slab, spaced 10 ft. center to center. The beams are designed for a load of 700 lbs. per square foot of roof surface. The columns are 20 in. × 24 in., with vertical reinforcing bars 1 in. square, banded with ⅜ in. round bars at intervals of 12 in. In all designs 20 in. × 24 in. piers are provided on the inner surface of the rear wall at the same intervals as the roof beams. A compression of 500 lbs. per square inch in the concrete and a tension of 12,000 lbs. per square inch in the bars were allowed in the design. Expansion joints are provided in the roof slab and buttress at intervals of 80 ft., the details of which are shown in Fig. 4.

The design shown in Fig. 3 requires 8 cubic yards of concrete and 1,500 lbs. of steel per running foot. The 3,300 ft. of concrete shed, which is now practically completed, cost about $465,000. The work was done under contract by Grant, Smith & Co. A large rock crusher and concrete mixer was installed

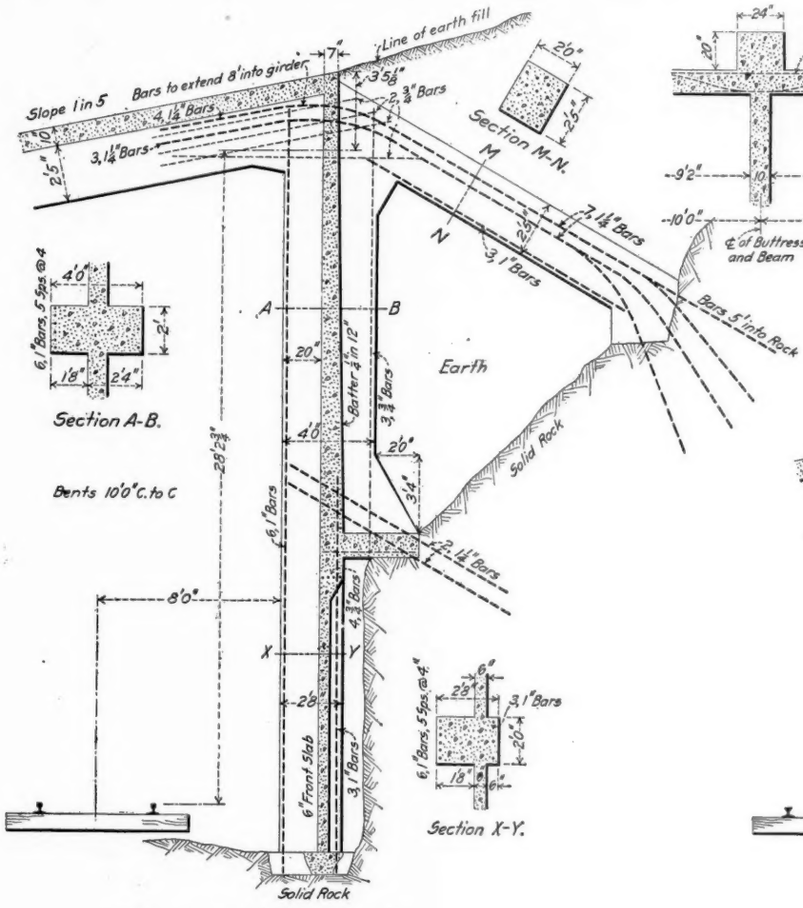


Fig. 2. Shed in Sloping Rock Cut.

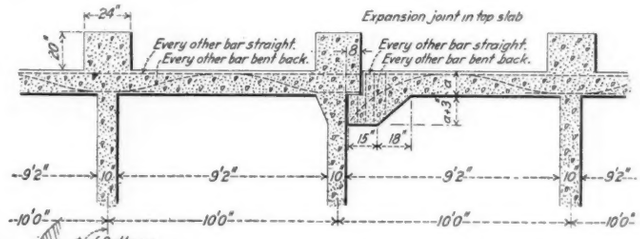


Fig. 4. Expansion Joint in Retaining Wall.

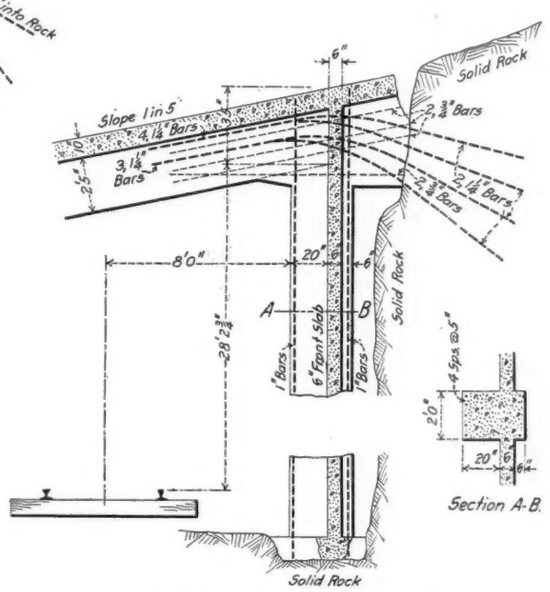


Fig. 1. Shed in Vertical Rock Cut

Figs. 1, 2 and 4—Concrete Shed in Rock Cut; Great Northern.

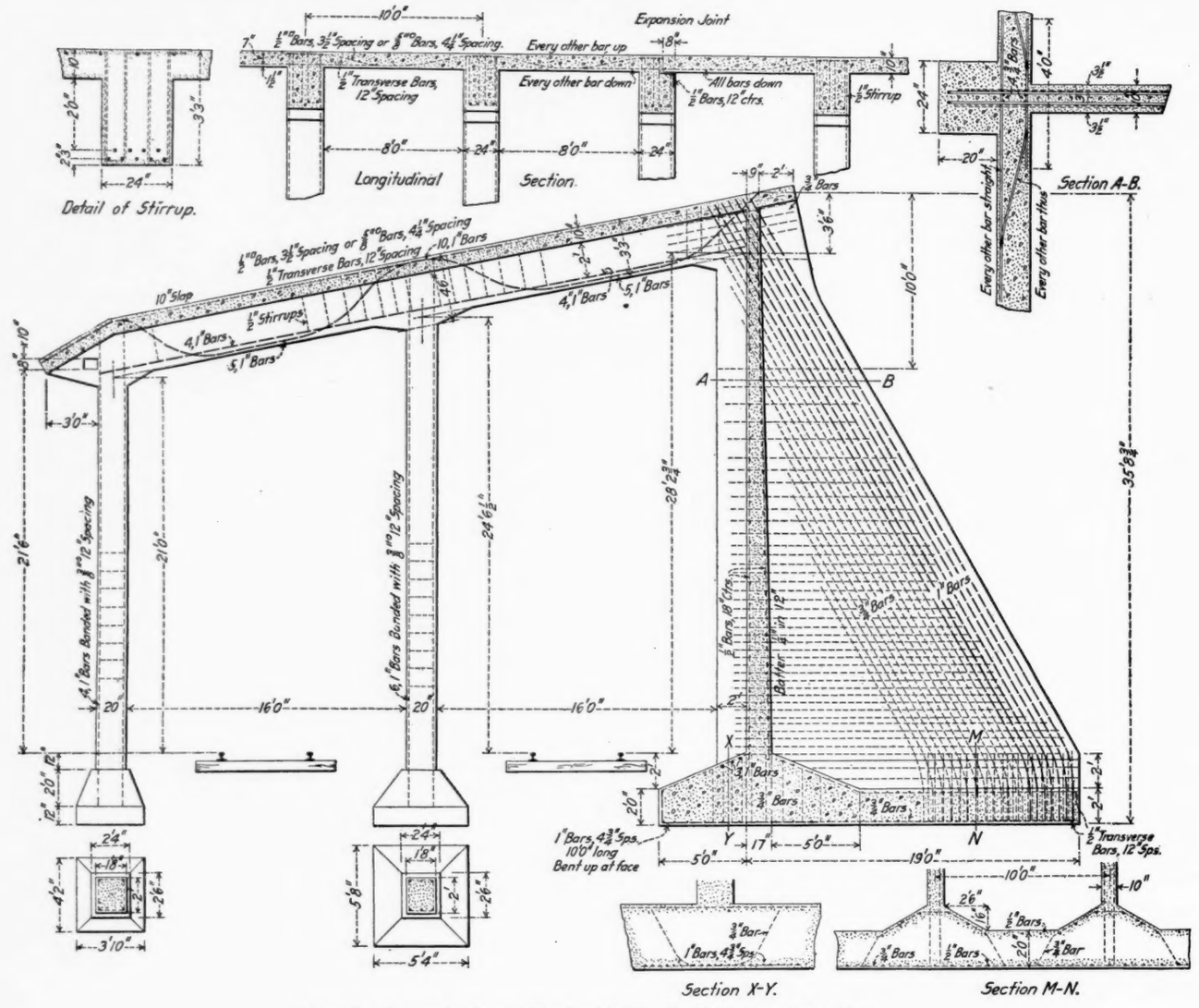


Fig. 3—Concrete Snow Shed with Earth Fill; Great Northern.

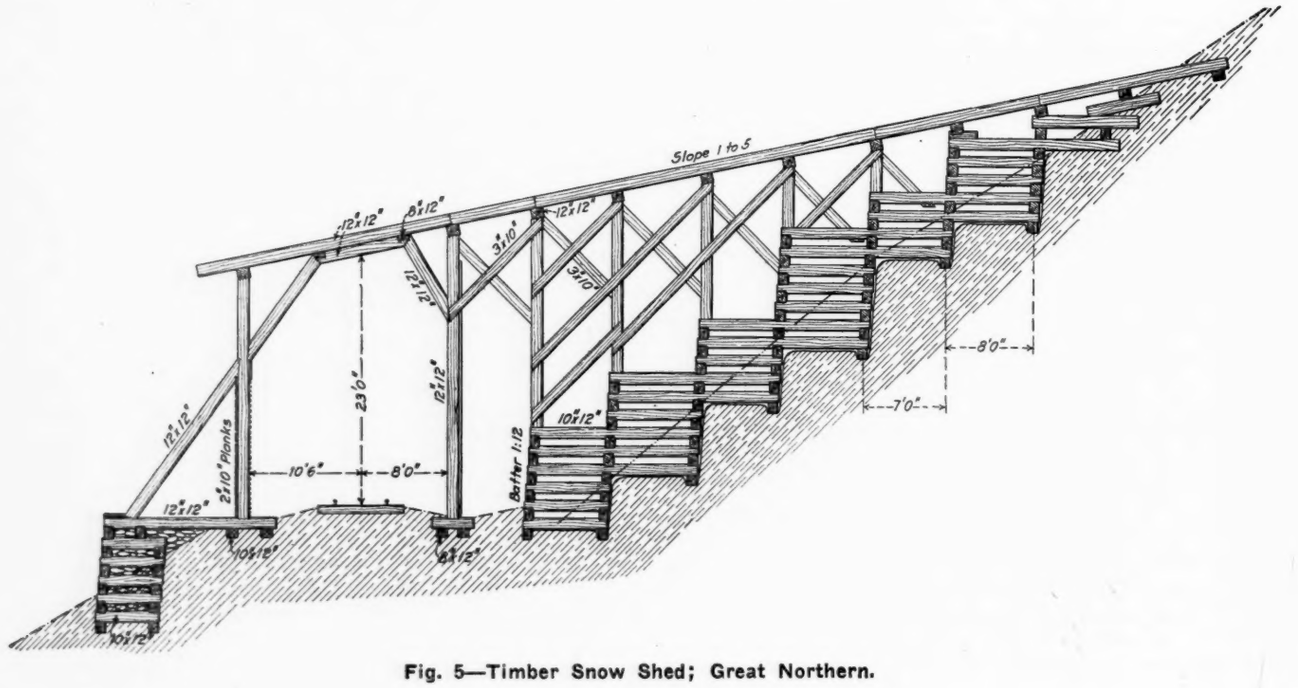


Fig. 5—Timber Snow Shed; Great Northern.

near the east end of the shed, and concrete was handled from the mixer to the forms in small dump cars on a temporary trestle.

In addition to the concrete shed, new wooden sheds have been built at 26 locations, providing protection for 5,411 ft. of track, besides the 17 sheds built in previous years, which cover 7,593 ft. The design of the timber sheds is about the same as those already built. A typical section of single track shed is shown in Fig. 5. The framing and roof are of 12 × 12 timbers, the roof being drift bolted to 12 × 12 longitudinal purlins. The crib work is of 10 × 12 timbers, the lower stick in each case being set in a trench. The posts are braced by 3 × 10 pieces. A number of the wooden sheds were built across draws which required the use of a great deal of additional material to extend the shed a sufficient distance down the draw to provide a path of low resistance for slides. On this account the average amount of lumber per lineal foot of track in some of the sheds is as high as 3,000 to 5,000 ft. b. m. The total cost of the new timber sheds is about $370,000.

For fire protection a 6-in. pipe line is being laid alongside the track from Wellington to Scenic. At frequent intervals standpipes will be located in the sheds, with a coil of hose ready for immediate use. Another innovation in the new sheds will be coal bins containing fuel for locomotives and rotaries in case of need. This provision should serve in many cases to prevent serious blockades.

Some heavy re-location work was begun during the past summer at Berne, 4½ miles east of Cascade tunnel. At this point, by re-locating 2.07 miles of line, the building of sheds was avoided. Smaller changes of line were also made at other points to get the track in a safer location, and in a number of cases buildings were rebuilt or moved out of danger.

THE SUPPLY DEPARTMENT.*

BY H. C. PEARCE.

General Storekeeper, Southern Pacific Company.

II.

GENERAL STORES.

The plan of organization for the general store is shown by the diagram. The general store is the jobbing house of the railway, and should be located at the general manufacturing plant, as conveniently located as possible to the foundries, rolling mills, and forge shops, and always conveniently located for switching and trackage. Where possible the general store should be located at the gateway to the system. Of course this can only be done when the general manufacturing shops are located in the same manner, as it is more desirable to have the general store at the principal manufacturing shops than at the gateway, the purpose always being to have the general store as near the market as possible. The manufacturing shops being the best market the railway company has, the general store must necessarily be connected with it.

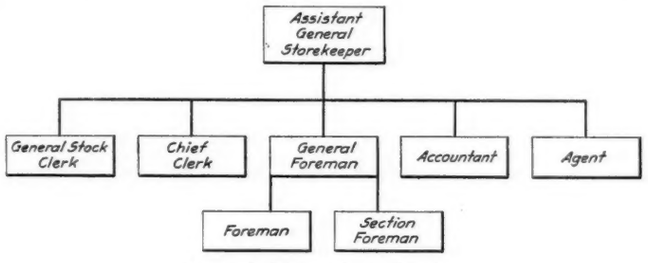
On most large systems, owing to the geographical location of its lines, markets, etc., it is necessary to have two or more general distributing stores, but the fewer the better. The ideal arrangement would be to have only one, for the reason that it means not only elimination of duplication in the organization, but also a great reduction in the investment of material. Generally speaking, it is necessary for the general material yards, that is to say, where lumber, piling, track material, etc., are assembled, to have a separate location, as it is more desirable to have this class of material located a shorter distance from where it is needed in order to save back haul, and more particularly to have it where it is most available for the entire system. The location is selected generally for the purpose of making it accessible to all points on the system in case of emergency, and will be treated in detail later. Were it possible to have the main shops, the general storehouse and general material yard all together at the gateway of the system, it would be the ideal arrangement.

The organization and facilities of the general store must be adequate to meet the maximum requirements. A fallacy of many railway officers is that large store buildings mean large stocks. The opposite is true. Ample room to have a place for everything and everything in its place is the only way a store can be operated economically, and with the minimum stock. It is absolutely essential and of first importance, and must be understood by all storekeepers, that material must be segregated, each kind and size separated, even though it may be necessary to clear off ground and pile it up outside.

While facilities are important and necessary to the economical care and handling of material, still they are of less importance than the organization. Therefore the first thing we must consider is an organization which is adequate promptly and fully to meet all requirements. The general store being the jobbing house of the system, it is really the transfer point, and it is therefore necessary that every detail should be planned along the line of economical and prompt handling.

The real purpose served by the general store is promptness in delivery, and the system must be such as to enable it to ship its goods as quickly as any first-class commercial jobbing house. Therefore its organization is of vital importance. In addition, it also serves the local division where it may be located and the company's principal shops. In this respect it is a division store as well as a general store.

In laying out this plan the writer had in view the prompt filling



General Store Organization.

of requisitions and economical operation. For this purpose it was laid off into sections, as shown. That is, the material was grouped with a view of convenience in handling and economy in operation, and with the further view of having a man in charge of each class of material who should be an expert in this particular class, and who actually handles it, both in and out. For this reason roadway material is put into one section, as it is necessary to have a practical track man in charge of this section. Section 2 contains bolts, nuts, lag screws and washers. This is a heavy stock that requires plenty of space and hard work, but it does not require a skilled or high-priced man to handle it. Section 7 contains air brakes, lubricators, injectors, steam heat equipment, headlight parts, etc. It is necessary to have a man who is an expert in this class of material; and, throughout, material of this same general class is grouped in one section with this purpose in view.

The sections are divided so they can be handled by one man, and only in a few cases is it necessary for a section foreman or storekeeper to have a helper, the idea being that it is better to divide them into additional sections as the volume of business increases rather than establsh a department. In this way we have one man who actually handles all the material in and out of a section, and who is actually responsible for the same.

Each section is operated as a separate store, and the foreman keeps his own stock books. He is furnished with a copy of every order for the purchase of material for his section, keeps his own "freight received" record, unpacks and checks the material into the proper section or shelves, and in every way conducts it as an independent store. Each section has its stock listed in books,

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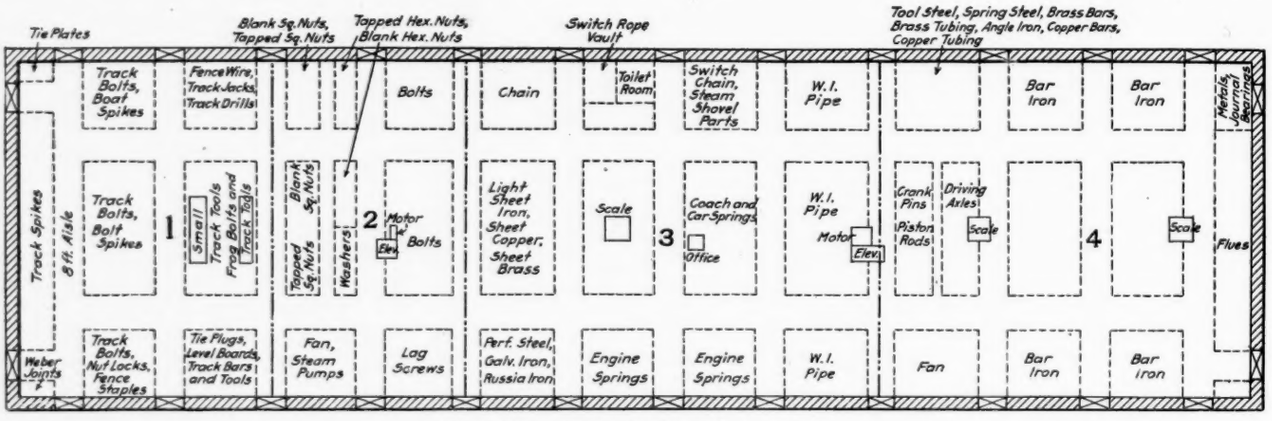
arranged alphabetically. These books show the compartment in which the material is located, technical description of the material, average monthly consumption, amount on hand and amount ordered each month. The stock is taken for requisitioning purposes each month and entered into the proper column. The section storekeeper then enters directly over the item on hand, the amount of unfilled requisitions, then enters after each item the quantity which he estimates will be required to cover a certain period (the basis of his calculation is 30 days) plus the time it takes for delivery and such special conditions as may arise, of material to the division or district served. In this way every unit is working simultaneously, instead of around a circle under a different organization.

Requisitions are made out by sections in accordance with the classification. On all stock items a stock limit is placed, which indicates to the section storekeeper that when he has reached this limit he must place requisition to replenish his stock and what he requires hurried on his requisitions. This is approved by the general stock clerk after he has personally investigated each case to see that it is necessary, and that nothing can be



First Floor Plan; General Storehouse.

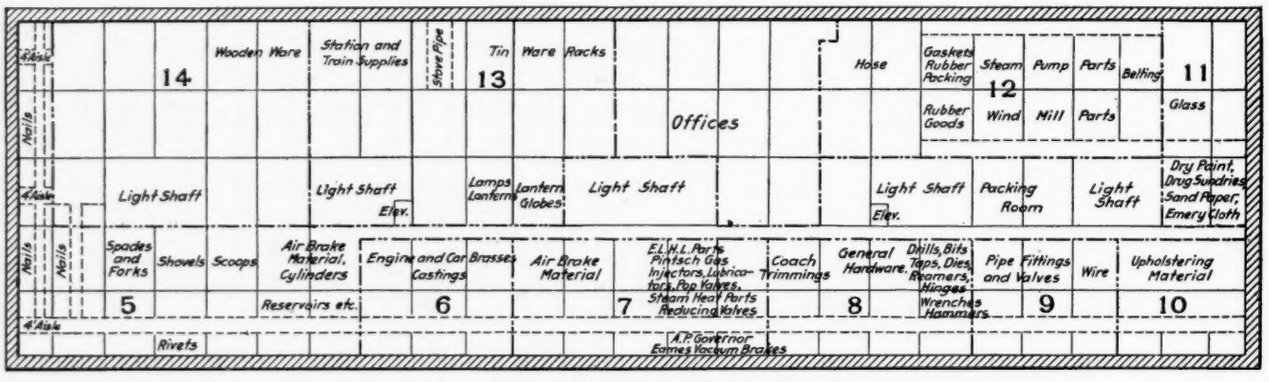
which is noted in the stock book. The stock books are then turned over to the assistant general storekeeper, who, in company with the requisition clerk, goes over each individual item, entering after such item in the stock book the requisition number that covers it, making such changes and corrections as his knowledge of conditions will warrant. The requisition is then made on the purchasing agent for what needs to be purchased, and transfer requisitions for such material as may be transferred from other points.

The entire organization is based on every person in it having a certain specific responsibility. For this reason the organization is in charge of the assistant general storekeeper, who is really the general storekeeper on the ground, but instead of his jurisdiction extending over the entire system his duties are confined to the operation of the general store. This leaves the general storekeeper free to operate over the system, giving each store its full share of attention and consideration.

Reporting directly to the assistant general storekeeper are chief clerk in charge of correspondence and such, general stock clerk in charge of general stock books and requisitions, accountant in charge of accounts, general foreman in charge of all outside work, section foremen in charge of each individual section, or separate store; agent in charge of receiving and billing of company material; supply car storekeeper in charge of delivery

substituted from the storehouses or along the line. Requisition is then made on the purchasing agent.

Each sub or division store is furnished with a general classification, also an indexed classification, showing in which section each class or each item of material is located. The requisitions are given a registered number, and the section to which they are sent noted after same. They go directly to the section to which they belong, where they are filled, package properly addressed, giving reference to the requisition number and section, and the bill attached to the box or package. They pass through the section storekeeper to the invoice or manifest clerk, who invoices or manifests them, after which they are filed in numerical order. The manifesting and invoicing of the day's business is all



Second Floor Plan; General Storehouse.

Reporting directly to the assistant general storekeeper are chief clerk in charge of correspondence and such, general stock clerk in charge of general stock books and requisitions, accountant in charge of accounts, general foreman in charge of all outside work, section foremen in charge of each individual section, or separate store; agent in charge of receiving and billing of company material; supply car storekeeper in charge of delivery done at night. This enables the consignee always to get his invoice or manifest before he receives the material. The section number is placed on the package or box so that the material, when it arrives at its destination, can be taken directly to the section to which it belongs, thus, it is not necessary to open it until it is ready to put away.

Each section storekeeper is required to inspect all material received by him, and is responsible for obtaining what is most suitable for the purpose. He keeps in touch with the user of the material, and calls the storekeeper's attention to any items which are not standard and interchangeable or suitable for the purpose.

He is also required to call attention to any material received which is too good for the purpose for which it is to be used. He also arranges for the inspection of material bought subject to the company's specifications at point of receipt.

The receiving foreman has charge of all material received, also checking, unloading, and delivery to outside aisles of each section. The force is divided into crews under a checker or gang boss. The bills are obtained each morning from the agent, and the bills for each car distributed among the checkers. The checker has a clip file with tally sheets attached to the waybills. The material is all checked, either in the car or on the platform directly outside the car door, and the tallies checked against the waybills. The material is all marked for the section to which it belongs and delivered to the outside aisles of the respective sections. The waybills, together with the original tally sheets, are turned over to the agent, who makes the freight bills and attaches same so that the freight bill, waybills and tally sheets are all together. These tallies are then copied into the "freight received" books.

The shipping foreman has charge of all shipments. His force is divided into crews under checkers or gang bosses, who take the material from the inside aisles of each section, together with the bills, and deliver it into the proper care. The shipping foreman has a schedule of shipping points grouped for the purpose of loading cars so far as possible directly to where the material is to be furnished. Each day he posts a loading list of the cars which are to be loaded and the territory which they cover. The shipping crew takes the material from the aisles of each section and puts it into cars in station order. The shipping bills are then attached to the requisition and this is filed with the agent who does the billing.

SHOP DELIVERIES.

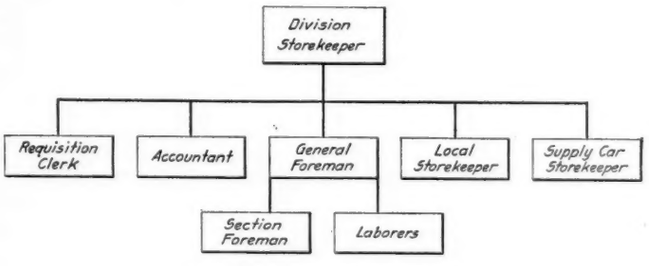
There should be a local telephone exchange for the shops and stores. The pits, machines and forges in the shops should all be numbered and with telephone booths established at different places in the shops. Each section in the storehouse should have a telephone, the number of which corresponds in number to the number of the section. In each of the booths in the shops should be posted the sectional arrangement of the storehouse, showing in which section the various materials are located. Material is all ordered by telephone directly from the section storekeeper, instructing what is wanted, where to be delivered and to what to be charged. All material is delivered by storehouse men and boys. Boys are employed for handling light material and men for the heavy. As soon as an order is received it is put up and a shop order made out, giving description, name of the foreman who ordered the material, number of pit and forge or machine to which it is to be delivered. The foreman's receipt is obtained on the shop order, which is returned and checked off on a blotter kept for this purpose by the section storekeeper. No shop men should be allowed in the storehouse.

The shop orders are numbered, priced and extended each day, and the charges abstracted to the proper accounts. This enables all concerned to know exactly what charges have been made to certain work, and enables the storekeeper to know how much business he is doing every day in order to keep track of the cost of operation. All material made in the shops for stock is made on store orders; that is, the storekeeper makes an order on the various shops for what he requires, exactly the same as he would on an outside firm. All material drawn in connection with the work charged is charged to this order, as well as the labor. When the work is completed it is delivered to the shop delivery crew, which gives a receipt for the material, taking up the duplicate store order and stub, which gives the detail of material and labor, and from which charges are made.

Shipments from the general store should be made in carloads, wherever possible, the division stores distributing to the work by supply cars, a method that will be described in another chapter.

It is the intention that requisitions should be filled as promptly as from any first-class department store. All requisitions for material which should be carried in stock should be filled within twenty-four hours from the time they are received. When the requisitions are received in the morning, they are delivered to the general stock clerk, who registers them and gives them a number as a means of identification. They are then checked against the surplus lists at outside division stores, and any items which can be filled from outside points are so indicated on the margin by the name of the store in pencil after the item, the purpose being to first make available material outside that is not needed, always aiming to keep the surplus concentrated at the general store. The requisitions are then arranged according to sections, and delivered by a messenger to the various section storekeepers, who indicate by a cross after each item whether it is on hand or provided for. They are then returned by the same messenger to the general stock clerk, who first draws off transfer requisitions for such material as can be furnished from outside points, purchase requisitions are made on the purchasing agent for such as must be bought, and the requisitions are then returned to the respective sections for filling, knowing that the material is provided for. Packing and shipment begin at once.

In this way action is obtained first on the material not on hand. For example, while one man is making a requisition on the purchasing agent for material which has to be bought, at the same time another man is making transfer requisitions on other stores for material which is located at other points on the road, and at the same time various section storekeepers in the storehouse are packing and putting up ready for shipment the material on hand, all to be finally assembled by the shipping foreman and forwarded in one car.



Division Store Organization.

Cars are loaded on schedule, that is, they are grouped as to territories so that all material is handled in car lots, practically no material being moved through local freight houses by way freights. Emergency shipments are moved in baggage cars by passenger trains. In this way extra car haulage is saved, but, above all, loss and delay incident to the movement of company material through local freight houses by local trains is avoided.

There is a floor foreman on each floor who has approximately the same duties as a floor walker in a department store. The lumber yards, scrap docks, oil houses and platforms are all operated in the same manner, each in charge of a section storekeeper or foreman, and each having its specified stock and duties to perform.

Details regarding the stock records, accounting and interior arrangement of stock will be given later.

DIVISION STORES.

The plan of physical organization shown by this chart is practically the same as the general store, modified and consolidated to conform to the business. In making these consolidations it should be noted that they do not in any way destroy the general plan of the organization. For example, the accountant and chief clerk are consolidated, one man being sufficient to do the office work in a division organization. The requisition clerk is consolidated with the storekeeper's stenographer, and is located in the office with the storekeeper, practically works with him as his assistant, handling and registering all the requisitions, preparing the requisitions on the general store from the stock books,

taking charge of and handling all the "hurries" and correspondence in connection with the material and the storekeeper's routine work. This for the reason that the division storekeeper must be personally familiar all the time with his stock and the conditions on the division. The general foreman is consolidated and called a store foreman, is located in the store, and has direct charge of the store. The sections are consolidated into as many as may be necessary in order to conform to the forces.

For an ordinary division store, two section storekeepers inside will be found sufficient. They usually divide the first floor, one man taking one side of the open aisle, which is used as a shipping room, and one the other, their stations being located on the edge of the aisle and close to the delivery counters. In this way they will be in close communication with the shop men who call for material, and be able to advise with them and the counter boys regarding what is needed. They, more than any other men, on account of their close relation with those who are actually applying it, are in a position to make available the material to meet the actual wants that exist.

The inside organization of a well regulated division store would consist of a store foreman, two section foremen (one on each side) and counter men. The section foremen, in addition to taking care of the local shop requirements, receiving stock, etc., would be putting up and getting ready for shipment all material and supplies going outside. On the outside, stationed on the platform, would be an outside foreman, who would have charge of all material on the platform, as well as the outside labor gang. Thus each man would have specific duties laid out to the maximum of his ability and training, and would be expected to be on his particular job all the time. In this way the most efficient and economical work can be obtained.

A typical layout for a division store suitable to meet the ordinary requirements of a division is shown herewith. The division store should be located at the division headquarters. The division storekeeper is the active representative of the supply department on the ground. He is required to know personally what work is going on, what are the immediate requirements, and, above all things, he is required to deliver what is wanted when it is wanted. He should report directly to the general storekeeper.

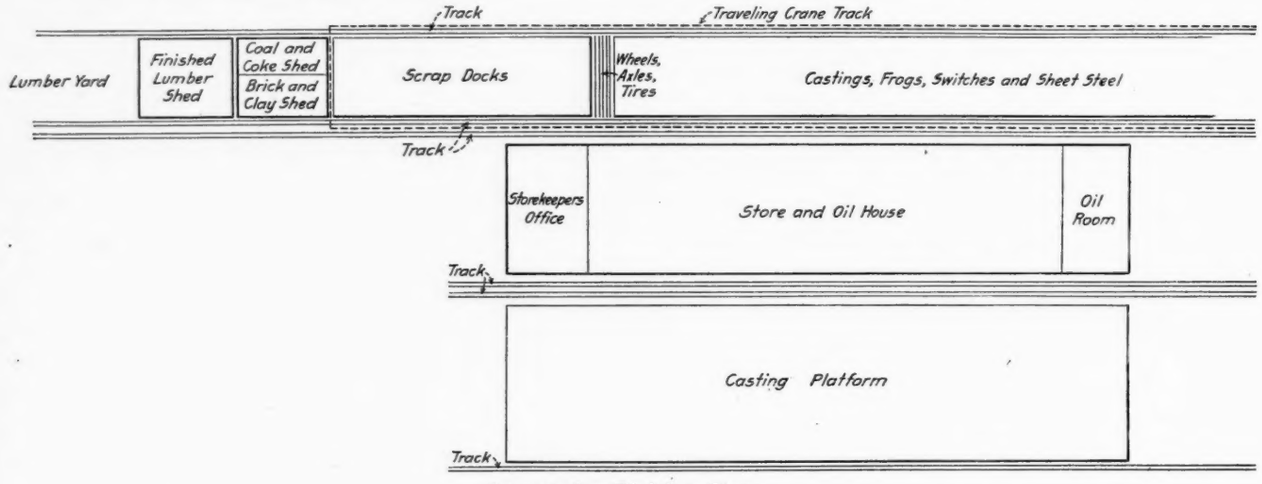
The division storekeeper makes actual deliveries to the work by means of the supply cars. These cars are in charge of a supply car storekeeper and helper, and serves as the connecting link between the division store and the work. These cars are run on schedule and monthly deliveries are made of all material used for general maintenance and operation, such as agents', pumpers', signal supervisors' and section foremen's supplies. Details regarding the handling of these cars are explained in another chapter.

The materials and supplies required for maintenance of equipment at outside roundhouses and car-repair points are delivered in like manner at different dates during the month. These cars not only deliver the stock necessary each thirty days to these points, but pick up and bring in all scrap, surplus and obsolete material. The division storekeeper usually will spend from five to seven days on the division in this manner and thus comes personally in touch with the work that is going on, and the actual application of the material.

It must be borne in mind that the supply department's business does not end with the mere filling of a requisition, it is required to follow this material until it is actually put into use, and, further, take charge of, and assemble it after its usefulness has been fulfilled, and arrange for further use or sale as scrap. These are the direct purposes of the supply department.

The division storekeeper is in line for advance as assistant general storekeeper, or general storekeeper. He is the most active representative of the supply department on the ground. He must maintain a thoroughly equipped and economical organization. His stock is regulated almost entirely by the deliveries he receives from the general store, the same as the stock for the general store, and the system, for that matter, is regulated by the deliveries received from the buyers.

Stock books are maintained in the division stores the same as in the general store, in fact, they are copies of them. All stock books and stock lists are written up in loose leaf at the same writing. Thus, if there are seven divisions on a system, the seven stock books are written up at the same time. Therefore not only the same items appear at all points with the same descriptions, but they are located in the same place in the books.



Layout for Division Store.

SUB OR LOCAL STORES.

At all points where sufficient material is maintained on hand to occupy the time of one man in handling and accounting, principally at roundhouses and car-repair yards, a storekeeper is employed who reports directly to the division storekeeper. And it is here where the foundation is laid for the personel of the supply departments. These men are selected in the first instance because they want work. They should have a good, common school education. By their daily association with men and things, they learn, not only the actual use of every piece of material, but they come to know by personal observation its exact use, and learn without effort what it is, where it goes, and what best serves the purpose. Further, and of still greater importance, they get the atmosphere and learn the ability of the men around them, who, in turn, advance up the ladder. They know what brings about certain things, and how the business of investigating and operating is conducted. This they learn without cramming, but through every-day work, and for that reason it is never dispelled. If with this the men couple honesty, industry and ambition, there

is absolutely no question but that they will advance. It is from these men that the organization is recruited. These men serve the company's interests best for the reason that they have absolutely nothing else to do but see that the material that is actually needed to do the work is furnished, and that nothing else is maintained. They are being constantly checked up, watched and criticized for having a piece of material or a dollar invested that is not necessary. This watchfulness of the company's material becomes the unit of their efficiency.

There is little doubt but what a man will develop to bigger things if given the opportunity. This is natural. The real trouble in developing men is that not sufficient emphasis is placed on the ground work. There is too much of a tendency to glide over details.

Generals are more easily obtained than privates when there are places to use them. It is a weakness of human nature that men desire to become generals before they have served as privates, but humble details always have been and always will be the basis of success. These men in the capacity of sub or local storekeepers are serving the company's real interests every day, saving them real money, and at the same time equipping themselves for a good living, and, in many instances, a career. It is the early installing of economy, industry and a thorough knowledge of why things are that makes the real capable man later.

CAB SIGNALS AND AUTOMATIC STOPS IN GERMANY.*

Opinions everywhere still differ widely as to the conditions which should be satisfied by a system to prevent overrunning of signals. The first serious attempt in Germany was in February, 1901, when the state railway office called together representatives from nearly all the German states. This meeting at the outset decided to consider only cab signals, not touching the question of automatic application of the air brakes. Experiments were thereupon made in Saxony with the "crocodiles" of the Northern Railway of France and with an audible device operated by carbonic acid. In Baden a "distance brake" was tried. Neither of these produced satisfactory results. In Prussia a special committee was appointed to "examine the many inventions of this kind which were submitted," but nothing useful was found.

The German Railroad Union also considered the question. In December, 1901, the Austrian Railway Ministry called the attention of the union to the fact that the demand for a cab signal continuously recurred. A technical committee of eleven members of the union took up the subject and made extensive inquiries by letter, and answered the Austrian Ministry by saying that audible signals were advisable, but they must be absolutely reliable. But no such devices were known. Automatic stops were considered inadvisable. This committee of eleven reported back in June, 1904, and its answer to Austria was adopted, but with a severe list of requisites. One of these was that "the device may only stop acting if the locomotive is standing still." Switches, if any, must be so constructed that the locomotive cannot be started unless they are in the correct position. The signal must not be given unintentionally by obstructions on the track which do not affect the running of the trains. These dicta were finally adopted by the Union September 3, 1904.

In 1905 a number of devices were submitted, designed to satisfy the conditions which had been laid down. None of them satisfied the conditions, however. But by 1906 there were a few devices sufficiently developed to make it advisable to try them. The Prussian State Railway then devoted considerable funds to systematic trials. Particulars of these trials, just as they were being begun, were published in the *Zeitung des Vereins Deutscher Eisenbahnverwaltungen*, 1907, No. 48.

Double-light distant signals were tried and this pattern is to be substituted for that formerly used. This alteration will be completed in a few years; the limit is the end of 1919. Experiments were made with combined detonating and visible signals on four different railways or divisions. With these three cartridges are placed at a time by a lever operated from the signal cabin. Working these in connection with signal levers, however, made trouble in the winter and they had to be disconnected a part of the time. This arrangement seems not to have found much favor.

In other experiments on four different roads or divisions, sirens and horns were set up at the side of the track to be electrically operated. With these, the head of the train, when it gets within about 1,200 ft. of the distant signal, causes the horn to sound, if the signal is standing at caution, and the sound continues until the head of the train has gone 160 ft. beyond the distant signal. These experiments are not yet concluded. With some express trains the sound of the horn was not loud enough to attract the attention of the engineman. In another case it had to be removed, because the people living nearby were inconvenienced by the noise. On three other roads experiments were made with an electric apparatus, using a brush for contact. This appears to have been an arrangement for showing a visual disk in the cab on approaching a distant signal. Six engines were equipped and contact bars were affixed in connection with all distant signals on a busy section between Wunstorf and Minden. Results not yet wholly satisfactory. The contact brushes were repeatedly damaged by ballast and by other things. Sometimes at high speed the appliance failed to act. On still other roads or divisions experiments were made with the Van Braam apparatus. In this device "slippers" on the locomotive slide on raised treadles, the lifting of this slipper causing a depression of a rod on the engine. Ten express locomotives in the Halle district were fitted with this apparatus; also some in the Hanover district. This apparatus was designed as an automatic stop, but the connection with the brakes was cut out so as to not do anything contrary to the advice of the Union. With this apparatus a recording instrument was in one case tried. There are two of the "slippers," and both of them must be raised before action in the cab will take place. In several cases the slippers were broken because (it would appear) they were hung too near the load limit line. During heavy snow storms the treadles could not be moved into position and the indications of the signals became uncertain and dangerous. It is proposed to have the ground apparatus fixed instead of having it movable and controlled by the distant signal. This would make it simply a marker. The Stettin directorate has made experiments with a wireless apparatus presented by C. Lorenz of Berlin; electromagnetic waves which were continually produced at a sending station were transmitted by induction to the telegraph lines along the track, and from them to a receiver placed on the locomotive. At those places where an approach to a signal was to be indicated, the waves going to the receiver on the locomotive were intercepted by a screen. This brought a wave-detector back to the zero position and a colored disk was shown. The experiments have shown that it is possible, within certain limits, to transmit signals to the locomotives; the strength of the waves, however, became materially reduced as the distance between the sending station and the locomotive increased. Then also the effect which the screen at the distant signal was intended to produce was also produced in another way, for instance by telegraph lines crossing the railway, by iron bridges, by iron signal posts, and even when the locomotive ran through a deep cutting. It is as yet hardly likely that this apparatus will give useful results.

Good results were obtained with a recording alarm. This seems to be a contact fixed at a signal to ring a bell in the cab if the signal is overrun; to stop the bell the engineman must record the overrunning. This apparatus has been tried by five different directorates, and all with good results, and additional orders have been given for the apparatus.

In conclusion, the writer thinks that the Prussian State Railway is warranted by these generally indifferent results in delaying action. Absolute reliability has not yet been attained and certainly not in the case of the Van Braam apparatus. The experiments will be continued and extended, and useful results may be expected.

*Abstract of a paper, by Mr. Hoogen, printed in the *Zeitung des Vereins Deutscher Eisenbahnverwaltungen*, and reprinted, in English, in the Bulletin of the International Railway Congress for November, 1910, page 3616.

General News Section.

The Chicago, Terre Haute & Southeastern, late the Southern Indiana, has dismissed all of its passenger conductors except two; no reason given.

President H. R. Williams, of the Chicago, Milwaukee & Puget Sound, is quoted as having announced that all the locomotives on the Tacoma Eastern, a subsidiary of this road, are to be made oil burners.

The country is now producing pig iron at a yearly rate of about 19,700,000 tons, as against a rate of 31,600,000 tons in February of last year. The total pig iron production in 1910 was in excess of 27,250,000 tons, or more than 1,450,000 tons beyond the best previous record—namely, 25,795,000 tons in 1909.—*Iron Age.*

The directors' room at the headquarters of the Long Island Railroad in the Pennsylvania station, New York City, is now adorned by portraits of all of the presidents of that company, which began its existence in 1834 and which has never undergone a change of name. Mr. Haff, secretary of the company, had a long and difficult task finding the portraits of the earlier presidents.

A. H. Plant, comptroller of the Southern Railway, says that the report that the Southern has determined to discontinue the employment of ticket collectors on passenger trains is without foundation. No change of policy in this matter has been even considered. On the other hand, the results of the employment of special men for this duty has been such as fully to warrant the continuance of the system.

In the favors granted by the king of England on New Year's day, three Americans—that is, Canadians—received notice, and now we have Sir William Mackenzie, president of the Canadian Northern; Sir Donald Mann, first vice-president of the same company, and Sir Thomas Tait, who is just returning to Canada after serving as chief commissioner of the government railways of New South Wales for several years past. All of these gentlemen were born in Canada.

The National Highway Protective Traffic Association has compiled statistics showing that the number of persons killed by vehicles in the streets of New York City during 1910 was 378. These are classified as follows: by horse-drawn vehicles, 158; by street cars, 114; by automobiles, 104. More than half of the 378 persons killed were children under 14 years of age, and in nearly half of these fatalities to children, the records say that the accident was due to the fault of the victim.

The Brooklyn Rapid Transit Company, operating the surface and elevated railways in Brooklyn, N. Y., has submitted to the New York State Public Service Commission, First district, a proposition to operate the Fourth avenue subway, which is being built by the city in Brooklyn, and to build and operate connecting lines, elevated or underground, so that, in connection with subways to be built by the city, the B. R. T. can run trains from Coney Island across the East river and Manhattan island to the shore of the Hudson river.

The Lehigh Valley has made an increase of about 10 per cent. in the wages of its locomotive enginemen, of whom there are about 900. The passenger runners on the heaviest engines are to receive 4.1 cents a mile and on other engines 4 cents; the freight runners will receive on the heaviest engines 4.75 cents a mile; on the next class 4.65 cents, and on other engines 4.50 cents.

The Lehigh Valley has increased the pay of conductors, to take effect from January 1. This increase affects about 1,400 conductors, and it is said that those running through freight trains will be advanced 10 per cent. and those on passenger trains and local freight trains 5 per cent. It is understood that the new rates are on a parity with those granted by the other eastern roads recently.

The Pennsylvania Railroad publishes statistics of the number of trespassers killed and injured on its line, which seem to show that the efforts of the officers of the company to prevent unlawful use of the railway premises by pedestrians and ride-stealers have produced very definite and gratifying results. The number of trespassers killed on the line throughout the system, east and west of Pittsburgh, in 1907 was 916; in the next year 743; the next 633, and in the year just closed 585. This makes a diminution in four years of 36 per cent., a record which we doubt the possibility of finding on the lines of any other large company. An officer of the company says that in the coming year the campaign is to be prosecuted with redoubled energy; new notices are to be put up and every officer and employee will be exhorted to do his best; and requests for the enactment of stringent laws will be presented to the legislatures.

Disastrous Collision in England.

In a collision near Hawes Junction on the Midland Railway, 260 miles north of London, on the morning of December 24, two cars of a passenger train were wrecked and, with five others, were completely destroyed by fire. Nine or more passengers were killed, most of the bodies being burned so as to be unrecognizable. The train was the northbound Scotch express. It was drawn by two engines and ran into two engines (without train) which were moving in the same direction as itself. It appears that these two engines had been standing on the main line and had been forgotten by the signal man who, within a short time before the accident, had had to deal with seven engines waiting to be turned. The two engines of the express were only partly overturned and, from a photograph of the wreck taken after the fire was extinguished, it would appear that the first two passenger cars were crushed against the tender of the second engine as against an immovable wall. If the circumstances are correctly reported the obvious comment of American signal engineers on this collision will be that the crying need at Hawes Junction is an installation of track-circuit route-locking.

Working in Hoosac Tunnel.

In the preparation of the Hoosac tunnel of the Boston & Maine for electric traction, the men drilling into the rock of the roof of the tunnel for the overhead supports, work inside of tents set up on the roofs of the cars of their train; and they are supplied with fresh air by compressors taking their supply from a point near the floor of the tunnel; all this to enable the men to work while engines are passing through the tunnel emitting great volumes of smoke. There are two tracks throughout the length of this tunnel (4¾ miles) and the work train occupies one track, while the trains continue to use the other. The work was begun at the West or North Adams end and it has now proceeded somewhat more than a mile into the tunnel on the westbound track. The workmen protect themselves with large hats and wear goggles; and before going into the tunnel they rub their faces with grease paint. The conductor in charge of the train maintains constant communication by telephone with the train despatcher's office at North Adams.

"Cement Age."

The Cement Age Company has bought *Concrete Engineering* and will consolidate the two papers. Headquarters will remain in New York. R. W. Lesley will continue to be the editor, with Allen Brett, associate editor. A. E. Warner, formerly business manager of *Concrete Engineering*, will become western manager.

New Subways for Boston.

A further extension of the rapid transit system of Boston, Mass., is recommended at a cost of $6,100,000 in reports submitted to the legislature recently by the joint board of the Boston Transit Commission and the Board of Railroad Commissioners. Three separate reports were made. A tunnel from Park street to South Station is recommended and a bill offered providing for its construction by the city and its lease to the Boston Elevated. The continuation of this tunnel from South Station to Andrew square, which lies on the line between South Boston and Dorchester, is also recommended to be constructed under provisions identical to those embodied in the bill for the South Station tunnel. The board does not approve building the West End

loop, which was advocated by residents and business men in Scollay square and Bowdoin square. As outlined in the reports the two tunnel extensions advocated would establish a through line between Harvard square in Cambridge and Andrew square in South Boston—Dorchester by way of Beacon Hill, Park street station and the South Station and other way stations, and the joint board suggests that the trains should make the full run.

J. A. Farrell to Succeed W. E. Corey.

James A. Farrell, the president of the United States Steel Products Company, was unanimously chosen by the finance committee of the United States Steel Corporation to succeed W. E. Corey as president. Judge Gary said in part that Mr. Farrell had been president of the subsidiary company since its foundation in 1903, and had shown great business capacity. He said further that Mr. Farrell had been connected with the steel industry for more than 25 years and was well qualified for the position. The recommendation of the finance committee is practically an election, as the election itself is merely a formality.

Bonuses on the Boston Elevated.

The Boston Elevated Railway has just made its usual distribution of Christmas gifts to its employees. The annual report of the company for the last fiscal year, which is dated December 31, gives the following information on this subject: "The company has continued its liberal policy toward its employees in respect to their wages, as well as in other matters. Compensation for learners during twelve months ending September 30 amounted to $37,813. There was paid during 12 months ending September 30 the sum of $6,869 as a guaranteed minimum wage for new or extra men. There was also paid as increased compensation to long-service men the sum of $71,895. There was paid in pensions the sum of $11,260. There was also paid in 'satisfactory service' money, in sums of $20 or $25 to each of the employees deemed worthy thereof, the sum of $74,130. The aggregate sum of increased payments to employees under the provisions adopted seven years ago, amounted during the year to $201,969."

A Despatcher Who Does Not Like the Telephone.*

When the phones were first put in the operators answered the bells promptly, as they did the telegraphic calls when they first learned to work on a telegraphic circuit, but now it takes as long to get the operators as it did by telegraph; largely because the station men have to do work outside. When an operator's bell rings he has no way of knowing whether it is for orders or for some unimportant message. With the telegraphic call it could be distinguished readily by the distinctive signal.

The telegraph has another advantage: When an operator starts to repeat an order by telephone and has it wrong the despatcher has no way to break him, but he keeps right on repeating it until he has finished, and then the despatcher has to send the order again, which could be avoided with the telegraph.

When a despatcher puts in a call by the selector and before the desired office answers another office gets busy, and when the man called finds the line in use he hangs up his receiver and goes about his work; on the telegraph circuit he could do this and still listen to the sounder.

After a despatcher has called an office, and before finishing with the operator he is necessarily interrupted by another office, he cannot simply tell the first office to wait a minute, as by telegraph, but he loses him altogether and has to go through the calling operation again, as the operator cannot be expected to sit there when he has other work to do.

I believe the telephone has given cause for the ever-increasing questions on a despatcher's circuit. The writer sent an order running a local passenger train one hour late and sent it five times to nine offices, which, when repeated, would total fourteen times it was transmitted on the telephone circuit. While the last operator was getting "complete" to the order, another office broke in and asked how the train was. Station operators seem to grow so they know nothing about what is being done on the line. When a train or engineman asks how another train is, or some ordinary question, the operator "does not know" and the despatcher is broken in on for the information. An assistant trainmaster says that he never receives any answer to a question asked of an operator other than "I don't know; I'll ask the despatcher."

All telephone circuits are installed with a set of rules which protect the despatcher from interference by others on the line. But the trouble creeps in and finally the superintendent or trainmaster finds that he can talk directly to some roundhouse foreman or roadmaster and thinks the business of sufficient importance to interrupt the despatcher's circuit, and this grows contagious. Next day the roundhouse foreman or roadmaster remembers how plainly he heard a man 200 miles away, and uses the same method to reach someone else. They will and do get in on the despatcher's circuit.

It is true that orders can be repeated faster on a telephone, and it is not so much work to call on the telephone, but messages cannot be sent so fast as by telegraph. If a message is transmitted fast enough to convey the sense in sentences, the operator cannot copy it, and the circuit remains idle between sentences, which allows others to get in and interrupt the service.

The efficiency of the telephone has decreased at least 20 per cent., due to the fact that the operators have grown back into the rut they were in with the telegraph. The telephone is superior to the telegraph where an operator goes to sleep on duty, but they are learning to cut out the bell when they wish to rest undisturbed.

The writer is well acquainted with two systems of telephones, and has worked both systems, but would welcome the telegraph again and would feel less tired than with the telephone.

With the telegraph a despatcher could get up, step to the window or the water cooler and still listen to his work. Now, with the telephone, you are practically tied as with a halter to the desk for eight to nine hours.

*From a letter in the *Train Dispatchers' Bulletin.*

Electrical Research at Mass. Tech.

The progress of the graduate electrical engineering work at the Massachusetts Institute of Technology is indicated by the number of students who are candidates for Master's and Doctor's degrees, which number is now greater than last year. Under the direction of Professors Pender and Wickenden, research is being carried on in relation to the effects of heat treatment on the magnetic qualities of silicon iron, certain transient phenomena that may occur in long electric circuits, the effect of high frequencies on the permeability of iron, the effective resistance and reactance of steel rails when conveying alternating currents, the selective action of spark gap lightning arresters with respect to frequency, the reflection of light from walls or ceilings, the disruptive strength of rubber insulated coatings on wires, and other things. The subject of illumination and photometry is now taught in the electrical engineering department under the direction of Professor Wickenden, who is the author of a well-known book on "Illumination and Photometry." A preliminary edition of a book on "The Principles of Electrical Engineering" has recently been issued by Professor Pender of this department.

Wood Preservers' Association.

The seventh annual meeting of the Wood Preservers' Association will be held at the Auditorium Hotel, Chicago, January 17-19. The following papers will be read and discussed: What Depths of Penetration Are to Be Expected with the Different Amounts of Preservative Usually Specified? David Allerton, The Kettle River Company, and R. L. Allardyce, International Creosoting & Construction Company, Galveston, Texas; Benefits Derived from Attending the Annual Meetings of the Wood Preservers' Association, William Townsley, Jr., Grasselli Chemical Company, New York; Difficulties Encountered by Plants in the North that Plants Located in the South Do Not Have to Contend With, Andrew Gibson, Northern Pacific Railway; What Per Cent. of Creosote Oil Can Be Withdrawn from Wood by Subsequent Vacuum, C. D. Chanute, O. Chanute & Co., Chicago; Should Sawn and Hewn Ties of the Same Kind of Timber of the Same Degree of Seasoning Be Treated in the Same Cylinder Load? H. J. Whitmore; Is the Covering of Retorts Economical and Practical? R. W. Yarbrough, National Lumber & Creosoting Company, Texarkana, Ark.; Some Results Obtained in This Country in Prolonging the Life of Railway Cross Ties by Preservative Treatment, as Shown by the Records

that Have Been Kept; and a Better Method of Keeping these Records, F. J. Angier, Kettle River Company; General Review of Timber Treating in this Country with Special Reference to Causes that Have Been and Are Retarding Its More Universal Adoption, J. T. Logan, National Lumber & Creosoting Company; Wood Block Paving, Dr. Hermann von Schrenk, Rock Island Lines. In addition to these there will be addresses by E. A. Sterling, forester of the Pennsylvania Railroad; J. H. Waterman, Chicago, Burlington & Quincy, and W. F. Goltra, of the W. F. Goltra Tie Company, Cleveland, Ohio.

No Lobbyists at the Missouri Capital.

As a result of an agreement reached by Governor Hadley of Missouri and C. R. Gray, vice-president of the St. Louis & San Francisco, representing the Missouri lines, the railways of that state will not this year be represented at Jefferson City, the state capital, by lobbyists. They will simply send to the capital a scout in the person of Frank G. Faulkner, assistant superintendent of the Frisco at Rollo, Mo. Mr. Faulkner is a practical railway operating man, and Mr. Gray, in a newspaper interview, defines his duties as follows:

"He will not be a legislative agent in the usual meaning of the term. In fact, he has instructions from the committee not to interfere with any bill for or against the railways. What he will do is to procure copies of all bills introduced that affect the railways and send them to the committee. He will keep the committee informed of the progress of these bills from time to time, and will arrange for the appearance of railway representatives at such hearings as they come up. Our new plan does away with the old-time lobbyist and his system. If a bill deals with passenger traffic we will send a man or men from that department to appear before the House or Senate committee. If it deals with freight traffic an expert in that line will appear for us. If the operating department is most interested it will be a man or men from that department who will submit the argument."

The passing of the railway lobby at Jefferson City is an event of importance in the history of Missouri, for probably never in this country was there a lobby which for a series of years more completely dominated the politics of a state. It practically ran both the democratic and the republican parties, and the methods that it used were thoroughly discreditable.

Railway Signal Association.

In accordance with the revised constitution of this association, the adoption of which was noticed in our issue of January 6, page 54, the board of direction (formerly "executive committee") has been increased in number to 15. This action was taken at a meeting of the old executive committee at Buffalo last week, and the new board is made up as follows: C. E. Denney (president); C. C. Anthony and B. H. Mann (vice-presidents); C. C. Rosenberg (secretary); H. S. Balliet, L. R. Clausen and A. H. Rudd (three past presidents); F. P. Patenall and A. G. Shaver; and the following new members, the first two of whom are to hold office until the next annual meeting and the other four for twelve months longer:

F. C. Stuart, Sunset Route.
J. V. Young, Boston & Maine.
C. A. Christofferson, Northern Pacific.
W. J. Eck, Southern.
E. W. Newcomb, Oregon Short Line.
T. S. Stevens, Atchison, Topeka and Santa Fe.

The board of direction has instructed the several committees as to the work to be done this year, as follows:

Committee I.—Signaling Practice and Standards. (a) Continue investigation and report on a uniform system of signaling. (b) Continue work on standard designs. Progress reports should be submitted at the March and June meetings. (c) Chairman of Committee No. I will advise chairmen of Committee II, III and IV, from time to time of work to be performed by his committee which will affect the work of these committees. A. H. Rudd, chairman of committee.

Committee II.—Mechanical Interlocking. (a) Investigate and recommend a device or arrangement that with slotted or power operated home signals will equally secure the safety of operation of mechanical interlocking apparatus that is at present afforded by the bolt lock in mechanical plants with pipe connected units. (b) Reconsider specifications for concrete foundations for signal apparatus, considering reports submitted by various committees at the last annual meeting and the specifications of the American Railway Engineering & Maintenance of Way Association, and submit reports for discussion at the March and June meetings if possible, and for adoption at the annual meeting. (c) Prepare specifications for interlocking for draw-bridges. Specify particularly the requisites for locking rails and interconnecting rail locks, bridge locks, wedges and the interconnection of these with derails and signals protecting the draw-bridge. (d) Submit floor and lead-out plans for mechanical interlocking cabins. C. J. Kelloway, chairman of committee.

Committee III.—Power Interlocking. (a) Continue investigation and submit the following typical plans for electric interlocking: Circuits for one-arm signal and single switch. Circuits for selecting signals. Switch detector circuits. Route locking circuits. Approach locking circuits. (b) Invetsigate and recommend a device or arrangement which will equally secure the safety of operation of electric interlocking apparatus that is at present afforded by the bolt lock in mechanical plants with pipe connected units. (c) Reconsider and complete specifications for electro-pneumatic interlocking on the lines of the specifications for electric interlocking. (d) Submit plans similar to those mentioned in (a), for electro-pneumatic interlocking. B. H. Mann, chairman of committee.

Committee IV.—Automatic Block. (a) Reconsider specifications for direct current relays, referred back to committee at the last annual meeting, and submit new specifications based as far as possible on the association's present specifications. (b) Continue work on detail specifications for material, taking them up in the order shown in the report submitted at the last annual meeting. (c) Supply typical automatic signal circuits for single and double track railways. A. G. Shaver, chairman of committee.

Committee V.—Manual Block. (a) Submit description of, and circuits for various controlled manual block signal installations now in service in the United States and Canada. (b) Supply similar information and circuits for staff installations. J. B. Latimer, chairman of committee.

Committee VI.—Automatic Stops and Cab Signals. Continue investigation and report the results of tests of any installations which are made during the year. R. C. Johnson, chairman of committee.

Committee VII.—Subjects and Definitions. Prepare definitions for technical terms connected with signaling, particularly any terms which discussions show are not properly defined. C. C. Anthony, chairman.

Committee VIII.—Arrangements. Make all necessary arrangements for the annual meeting. T. S. Stevens, chairman.

Committee IX.—Wires and Cables. (a) Continue investigation, especially in regard to tests for rubber insulation. (b) prepare specifications for wires or cables for any special uses, which are not covered by the adopted specifications. (c) Continue investigation as committee thinks desirable in regard to inspection of wire by wire inspection bureaus, making recommendations accordingly. W. H. Elliott, chairman.

Committee X.—Electric Signaling for Electric Railways. (a) Continue investigation and make further report on the various systems in satisfactory operation. (b) Prepare specifications for A. C. operated automatic signal installations on electric railways. H. S. Balliet, chairman.

Committee XI.—Manual. Review the journals and make report on subjects which have been approved by the association and should be included in the Manual. F. P. Patenall, chairman, Baltimore & Ohio, Baltimore, Md.

Committee XII.—Contracts. (a) Submit recommended form for contracts for joint interlocking plants. If possible, submit brief outline of proposed contract for discussion at the March meeting. (b) Recommend basis for division of expense of construction, operation and maintenance of joint interlocking plants. L. R. Clausen, chairman, C. M. & St. P.

Special Committee.—Promotion of Signaling Education. Continue investigation and compilation of data on all subjects pertaining to signaling. W. J. Eck, chairman.

Special Committee.—Method of Recording Signal Failures. Reconsider forms submitted at the last annual meeting, paying particular attention to the points discussed, and secure information, if possible, from roads using the reports submitted, making a complete report at the annual meeting. J. C. Young, chairman.

Special Committee.—Storage Battery. (a) Continue standardization of parts and accessories of storage cells. (b) Prepare specifications for portable cells. (c) Investigate and report on designs for housing of storage batteries for interlocking and automatic signal work. A. H. Yocum, chairman.

The Chicago Signal Club.

At the meeting of the Chicago Signal Club held, January 9, at Chicago, C. G. Stecher, of the signal department of the Chicago & North Western was elected permanent chairman to succeed W. H. Arkenburgh, who has resigned on account of ill health. D. R. Morris, of the signal department of the Illinois Central was elected vice-chairman, and the duties of the treasurer were combined with those of the secretary. The subject of Fouling Protection was again discussed at length, and much interest was aroused in the debate. The next regular meeting of the club will be held on Monday, January 23, at the offices of the *Signal Engineer,* Chicago. The subject for discussion is the Polarity of Track Circuits on Multiple-Track Lines. All signalmen in Chicago and vicinity are cordially invited to be present.

Railway Supply Manufacturers' Association.

Circular No. 1 of the Railway Supply Manufacturers' Association gives such details as are at present available concerning the plans for the exhibits at the Master Mechanics' and the Master Car Builders' conventions at Atlantic City next June. The exhibits will be, as usual, on Young's Million Dollar Pier, and 76,278 sq. ft. of exhibit space has been provided, an increase of something over 5,000 sq. ft. The price of the space is 40 cents per sq. ft., as before. Space will be assigned on February 16, 1911, at the office of the secretary, J. D. Conway, Oliver building, Pittsburgh, Pa.

Cleveland Passenger Club.

At the annual meeting of the Cleveland Passenger Club, held at the Hotel Euclid on January 6, the following officers were elected for the ensuing year: President, A. J. Kennedy (Santa Fe); vice-president, F. L. Muehlhauser (Eastland Navigation Company); treasurer, William McGreevy (Rock Island); secretary, F. A. Hunt (New York Central Lines); members of the executive committee, C. A. Browne, chairman, J. K. Dillon, W. T. Buss, E. M. Presley, Howard Jolly and E. B. Parsons.

Canadian Society of Civil Engineers.

At a meeting of the mechanical section of the Canadian Society of Civil Engineers, held on January 5, at Montreal, Que., a paper was read on Recent Advances in Machine Tool Construction, by Thomas Reid, of the John Bertram & Sons Company, Dundas, Ont.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

AIR BRAKE ASSOCIATION.—F. M. Nellis, 53 State St., Boston, Mass.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—A. G. Thomason, Scranton, Pa.; next meeting, June 22, 1911; Niagara Falls, N. Y.

AMERICAN ASSOCIATION OF GENERAL PASSENGER AND TICKET AGENTS.—C. M. Burt, Boston, Mass.; next meeting, St. Paul, Minn., 1911.

AMERICAN ASSOCIATION OF LOCAL FREIGHT AGENTS' ASSOCIATION.—G. W. Dennison, Pennsylvania Co., Toledo, Ohio.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—O. G. Fetter, Carew building, Cincinnati, Ohio; 3d Friday of March and Sept.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—H. C. Donecker, 29 W. 39th St., New York.

AMERICAN RAILWAY ASSOCIATION.—W. F. Allen, 24 Park Place, New York; May 17, New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago; Sept. 17-19, 1911; St. Louis, Mo.

AMERICAN RAILWAY ENGINEERING AND MAINTENANCE OF WAY ASSOCIATION.—E. H. Fritch, Monadnock building, Chicago; March 21-23, 1911, Chicago.

AMERICAN RAILWAY INDUSTRIAL ASSOCIATION.—G. L. Stewart, St. L. S. W. Ry., St. Louis, Mo.; May 9, 1911; Detroit, Mich,

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago; June 14-16, 1911, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—O. T. Harroun, Bloomington, Ill.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—C. W. Hunt, 220 W. 57th St., New York; 1st and 3d Wednesdays, except July and August; annual, Jan. 18-19, New York.

AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—D. J. Haner, 13 Park Row, New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 29th St., New York.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—C. G. Phillips, 143 Dearborn St., Chicago; April 26, 1911; New Orleans, La.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—J. R. McSherry, C. & E. I., Chicago; May, 1911; Montreal, Can.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—G. B. Colegrove, I. C. R.R., Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—P. W. Drew, 135 Adams St., Chicago; June 19, 1911; Boston, Mass.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 24 Park Place, New York; June 20-21, 1911, Cape May City, N. J.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tuesday in month, except June, July and Aug.; Montreal.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 413 Dorchester St., Montreal, Que.; Thursdays, Montreal; annual, Jan. 24-27, Winnipeg, Man.

CAR FOREMAN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month; annual, Oct. 9, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo, N. Y. Next annual meeting, Jan. 12, Buffalo, N. Y.

CIVIL ENGINEERS' SOCIETY OF ST. PAUL.—D. F. Jurgensen, 116 Winter St., St. Paul, Minn.; 2d Monday, except June, July and Aug.; St. Paul.

ENGINEERS' SOCIETY OF PENNSYLVANIA.—E. R. Dasher, Box 704, Harrisburg, Pa.; 1st Monday after 2d Saturday; annual, Jan. 16, Harrisburg, Pa.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—E. K. Hiles, 803 Fulton building, Pittsburgh; 1st and 3d Tuesday; annual, Jan. 17, 1911; Chicago.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Rich., Fred. & Pot. R.R., Duluth, Minn.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—H. D. Judson, 209 East Adams St., Chicago; Wednesday preceding 3d Thursday; Chicago; annual, July 19, Chicago.

OMAHA RAILWAY CLUB.—A. H. Christiansen, Barker Blk.; second Wed.

INDIANAPOLIS RAILWAY AND MECHANICAL CLUB.—B. S. Downey, C., H. & D., Indianapolis, Ind.

INTERNATIONAL MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York; next convention, Omaha, Neb.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—D. B. Sebastian, La Salle St. Station, Chicago; May 15-18, 1911; Chattanooga, Tenn.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn. Next convention July 25-27, Chicago.

INTERNATIONAL RAILWAY MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, Lima, Ohio.

INTERNATIONAL RAILWAY CONGRESS.—Executive Committee, rue de Louvain, 11 Brussels; 1915, Berlin.

IOWA RAILWAY CLUB.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, Old Colony building, Chicago; June 19-21, 1911, Atlantic City, N. J.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION, OF UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass.

NEW ENGLAND RAILROAD CLUB.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tuesday in month, except June, July, Aug. and Sept.; Boston.

NEW YORK RAILROAD CLUB.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.

NORTHERN RAILWAY CLUB.—C. L. Kennedy, C., M. & St. P.; 4th Saturday; Richmond, Va.; 20th annual, June 21, 1911; St. Paul, Minn.

RAILWAY CLUB OF KANSAS CITY.—C. Manlove, 1008 Walnut St., Kansas City; 3d Friday in month; Kansas City.

RAILWAY CLUB OF PITTSBURGH.—C. W. Alleman, P. & L. E., Pittsburgh, Pa.; 4th Friday in montn, except June, July and August; Pittsburgh.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Bethlehem, Pa.; March 20, Chicago, annual, Oct. 10, Colorado Springs, Colo.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, Box C, Collinwood, Ohio; annual, May 22-24, 1911; Milwaukee, Wis.

RICHMOND RAILROAD CLUB.—F. O. Robinson, Richmond, Va.; 2d Monday, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; Oct., 1911; St. Louis.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—C. Nyquist, La Salle St. Station, Chicago; Sept. 12-14, St. Paul, Minn.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. Ry., Montgomery, Ala.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Prudential bldg., Atlanta, Ga.; 3d Thurs.; Jan., April, August and Nov.; Atlanta.

TOLEDO TRANSPORTATION CLUB.—L. G. Macomber, Woolson Spice Co., Toledo; 1st Sat.; annual, May 6, 1911; Toledo.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August; New York; Jan. 17.

TRAFFIC CLUB OF PITTSBURGH.—T. J. Walters, Oliver building, Pittsburgh, Pa.; meetings monthly; Pittsburgh.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7042 Stewart Ave., Chicago; annual, June 20, 1911; Baltimore, Md.

TRANSPORTATION CLUB OF BUFFALO.—J. M. Sells, Buffalo; 1st Sat. after 1st Wed.; annual, Dec. 11, 1911.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. & H. R., East Buffalo, N. Y.

WESTERN CANADA RAILWAY CLUB.—W. H. Rosevear, P. O. Box 1707, Winnipeg, Man.; 2d Monday, except June, July and August; annual, May 8, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, Old Colony building, Chicago; 3d Tuesday of each month, except June, July and August.

WESTERN SOCIETY OF ENGINEERS.—J. H. Warder, 1735 Monadnock Block, Chicago; 1st Wednesday in month except July and August; Chicago.

WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, First National Bank bldg., Chicago; annual, Jan. 17-19, 1911; Chicago.

Traffic News.

Shipments of anthracite coal during the last calendar year amounted to 64,905,786 gross tons. This is an increase of 4½ per cent. over the preceding year, but is less than the total for 1907. The Reading carried the largest share of this coal, nearly 12,500,000 tons. The Lehigh Valley was second and the Lackawanna third.

On the Rock Island road conductors now collect cash fares in Chicago suburban territory at the rate of 3 cents a mile. The Illinois 2-cent fare law permits railways to make charges on a 3-cent basis when passengers pay cash instead of buying tickets. Other roads handling a large suburban business in Chicago are already enforcing this rule.

The Merchants' Association of New York has secured from the railways reduced rates for buyers coming to New York city in January, February and March, the same as in former years, but the reduction is not quite so large. Passengers will pay full fare on their journey to New York and will have to pay three-fifths fare returning. The tickets are sold on the certificate plan, as heretofore.

The western, transcontinental and southwestern lines have declined to accept a proposition from the government that they shall equalize the rates for the handling of government troops, employees and freight via the land-grant and non-land-grant railways. On the land-grant railways the government is entitled to reductions from the regular rates, and it desires the non-land-grant railways to meet these reduced rates. The lines referred to probably will make an alternative proposition to the government.

Thomas M. Osborne, until recently a member of the New York Public Service commission, Second district, has made a complaint to the up-state commission against the charge by the New York Central & Hudson River for the taking care of parcels at parcel rooms. Mr. Osborne called attention to the fact that of the lines in New York state 10 cents is charged for every article deposited, but that on the Boston & Albany and on the Pennsylvania Railroad the charge is but five cents, and in England the charge for such service is two pence, or approximately four cents. The commission is asked to make an order requiring all stations in a community above a certain size to fix a reasonable minimum.

The Burlington's Argument for Raising Rates.

The following extracts from the brief which Chester M. Dawes, general counsel of the Chicago, Burlington & Quincy, has filed in the rate advance cases state in a concise way the grounds on which this company bases its contention that it is entitled to higher rates:

"The rate advances amount to and will increase the gross revenues of the Chicago, Burlington & Quincy about $237,200.52 per annum. This is based on the tonnage of the commodities carried in the fiscal year 1910 as estimated from the representative months of September, 1909, and March, 1910. The wage increases already granted to several classes of this company's employees will increase its operating expenses $350,000 for the next fiscal year.

"There are especially pressing demands for expenditures on its existing railways which have been deferred for lack of money but required to enable the company to safely, economically and properly meet the reasonable needs of the public for transportation facilities, of about $8,000,000. There will further be required for several years to come not less than $15,000,000 or $20,000,000 each year in order to keep its property abreast of the times, and to maintain an efficient and serviceable railway. These amounts, if raised, must and should chiefly come out of income.

"The net operating income of the company for the fiscal year of 1910 was $22,481,636.39. By net operating income is meant operating revenue less operating expenses, taxes and balance of rents, income from securities owned and other income and interest. For the past three years the company's net operating income, not deducting amounts expended for betterments, and amounts carried to sinking funds, has averaged $21,070,717 per annum.

"It will be seen that, applied to the minimum estimated value of $530,000,000, the average net income above returns only 3.98 per cent. on the value of the property and 5.26 per cent. on the value for taxation, which is far less than that reasonable and fair return which the owners of the property are entitled under the law and which the public interest in efficient and improved transportation facilities requires they should receive.

"This company rests its right to make the advance in rates now in controversy upon the fundamental propositions which may be briefly stated as follows:

"The company is entitled, as a matter of legal right, to a fair return upon the actual value of its property used for transportation purposes, which value, from whatsoever source in the past created, is measured in its case by at least the cost of presently reproducing its physical plant.

"To obtain such fair return, it necessarily and equally is entitled to charge in the aggregate rates of transportation which, subject to the one limitation that the particular component rates are themselves reasonable and just to the shipper, will produce reasonable return upon the property employed.

"The railway having such right to a fair return, and now being unquestionably within that limit, finds itself confronted with the need of additional revenues to meet wage advances and other proper operating and maintenance charges and to offset diminishing earnings.

"It is not required under the facts and the law to show increased operating expenses and demands as a justification for advancing rates, but they are explanatory and offered as showing the particular occasion of the advances at this time.

"The advances on the commodities selected are small in amount, reasonable in view of the value of the service to the shipper and just and nondiscriminatory with reference to other rates and classes of traffic, and, indeed, transportation costs will thereby be more equitably distributed than at present."

New York Central's Case in the Rate Hearing.

Clyde Brown, representing the New York Central lines, was the first speaker Tuesday before the Interstate Commerce Commission in the hearing on the proposed increased freight rates in official classification territory. He directed his argument particularly to the question as to whether the proposed advances were justified in their application to the principal companies composing the New York Central lines.

The result of operations on the New York Central lines in 1910 compared with 1909, Mr. Brown said, show that for 1910 the surplus would be approximately $1,000,000 as compared to $4,700,000 for 1909, no improvements being made from surplus in either case, a decrease of $3,700,000. If the business of 1909 had been transacted under the wage scale in force April 1, as well as the conditions of service, the increase in the operating expenses for that year would have been $3,590,000.

For the ten months up to October 31, 1910, the surplus earned by the N. Y. C. & H. R. was $1,743,022, but Counsel Brown pointed out that this included the extra dividend of 6 per cent. declared by the Lake Shore & Michigan Southern received by the N. Y. C. & H. R. in March amounting to $2,717,000. If this unusual income had not been received the surplus would have been turned into a deficit of $974,000.

Counsel called special attention to the large expenditures which were being made by the N. Y. C. & H. R., particularly at the new terminals. In this connection and in answer to a question by Commission Prouty, Clyde Brown said the freight terminal on the west side of Manhattan Island was in the streets and had been more or less of a controversy between the city and the company.

"We believe we have a perpetual easement on the streets there," said Mr. Brown, "but there is some controversy as to our exact legal rights, and when plans can be made satisfactory to the company and city for changes, that improvement must be undertaken, and it will be an improvement when undertaken which will be commensurate in magnitude with the Grand Central and electric zone improvement, because it will involve an elevation or depression of tracks, and various conditions are likely to be imposed by the city which it will be necessary to comply with because of the power which the city has to deal with these things."

Commissioner Prouty suggested that when the electric zone

was completed the road would be able to handle a great deal more business. Counsel replied that the question was whether there would be business there in any sort of ratio to the increased terminal charges. The Grand Central terminal was not built with an eye only for increased business in the next five or ten years, but practically for perpetuity.

Counsel pointed out that the amount of capital required to complete the improvements now in progress is $42,000,000. Commissioner Prouty asked whether it had been determined to meet this by the issue of stock and bonds and counsel replied that no determination had been reached so far as he knew. Asked whether the road would not after such an issue still earn 6 per cent. net, counsel replied in the negative, saying that there would be a deficit of about $1,500,000.

Mr. Brown pointed out that as the New York Central leased 2,600 miles of its road and owned 800 miles, its capital expenditures on the leased lines between 1900 and 1909 had been $59,448,348, but no separate account of revenue was kept.

Commissioner Prouty wanted to know why the new terminal was built, in view of the fact that the Grand Central station which was torn down was comparatively modern. Counsel replied that the immediate cause was the terrible accident in the Park avenue tunnel, which was attributed by the public to congestion of traffic and smoke in that tunnel. Legislation was passed prohibiting the use of steam, thus requiring the electrification of the road below a certain point. The fact that the Pennsylvania road was to construct a new terminal in New York had had nothing to do with it.

Referring to the fact that the N. Y. C. & H. R. lines are capitalized at about twice the amount per mile, as compared with the Pennsylvania Railroad Company, Commissioner Lane expressed great curiosity as to the reason therefor. Counsel Brown said one reason was that the Central leased so many lines. Mr. Lane said this was not a sufficient answer. Attorney Gowen interjected the suggestion, which seemed to be satisfactory, that if the western lines of the Pennsylvania were taken into consideration as were the western lines of the Central, the discrepancy of capitalization per mile would be very materially reduced.

Mr. Brown concluded his argument by presenting statistics relative to the financial condition of the several companies composing the Central system. This system, he said, was responsible for a total volume of investment securities now outstanding amounting to $692,777,527. On this amount the investment return was 4.79 per cent. On this great capitalization from gross earnings of $100,000,000, and from large investment profits, the surplus available for improvements in 1910 will be about $1,000,000. There is $42,000,000 additional capital needed to meet works already entered upon, and if the company is to meet the demands of the community it serves, it should raise further $100,000,000. The proposed increased rates would enable the earnings of a surplus of $4,500,000, and counsel held that this was a moderate enough sum for the improvement of its property, and the maintenance of its credit.

Clifford Thorne was the first of the counsel for the shippers to be heard. He announced that he would speak briefly, reserving his main argument for the conclusion of the western rate case. He declared his belief that these questions now before the commission were as important to the country as a whole as any since the Dred Scott case. Whether the revenue yield to the carrier is a fair return upon the capital invested was, in his opinion, the real test which should guide the commission in reaching its decision. In order to find that, it was necessary to find the present valuation of the properties, and he believed that the commission would have to take that matter into consideration.

He decried the idea that the credit of the railways was in any way threatened, and he promised to show later that it was better than the credit of industrial or manufacturing companies. He then took up particularly the rates on live stock, protesting against the proposed increases on behalf of the Iowa shippers. From that state is shipped 40 per cent. of the live stock packed at Chicago, and 40 per cent. of that is shipped East as dressed meat. He protested because the rates from Chicago to New York were advanced from 8 per cent. to 18 per cent., and because live stock was advanced more than dressed meat. The effect of this was to stifle the development of competition in the East against Chicago packers, and to tighten the hold of the latter upon the packing industry.

Attorney Fisher at the afternoon session announced his purpose to show that the only way in which the roads had attempted to meet the burden of proof was on the presumption that the rate structure in effect on January 1, 1910, was just and reasonable. The shippers did not admit this. He proceeded at considerable length to argue that the roads had not met the requirement of the law that they should justify proposed advances.

Mr. Fisher complained that there was nothing before the commission, no statement in dollars and cents, which could be used as a basis upon which to estimate whether the cost to the carrier of the service to the shipper had been increased as has been claimed. He thought that the presumption of the commission should be that, if such figures really existed, they would have been brought forward by the railways because they had the facts at hand and the shippers had not.

Declaring that it was within the power of the commission to obtain at least a prima facie justification for the reasonableness of the increased rates, Attorney Fisher argued that one essential, if not the controlling requirement, should be a physical valuation of the railways.

Commissioner Prouty said that Congress had been asked to have such a valuation made for the very reason that the commission had hesitated to accept a valuation offered by the roads themselves.

"It would probably be the work of years to value these properties. Could we hold up a decision in this case to that extent?" asked Mr. Prouty.

"Yes, I think so," cheerfully replied Attorney Fisher, "unless, of course, the commission thought that there was a crisis in railway affairs. There is no evidence of such a crisis. When the railways come asking for increase of rates in order to secure a proper return on their capitalization they should have something definite to show. The most that they assert is that their surplus will be reduced if they don't get the increases and that is easily to be doubted."

Attorney Fisher protested especially against the advances in the lake and rail rates for which, he said, no justification had been offered in evidence. The only excuse advanced was that it was necessary that the arbitrary differential should be maintained. In other words, the water rates must be increased or otherwise goods would be transported by water. The whole argument, he said, was based on the theory that the lake and rail arrangement was a monopoly in the hands of the railways.

Francis B. James of Cincinnati who followed, also made strong protest against the lake and rail advances, saying that their effect would be to upset all relations of rates in official classification territory.

Attorney James, referring to the proposition of President McCrea of the Pennsylvania road that for every dollar paid out in dividends there should be a dollar put into surplus, declared that there was not a railroad in the country which had done this for any period of time. It had been done spasmodically, but it was untrue as a transportation dogma or principle.

INTERSTATE COMMERCE COMMISSION.

Washington reports say that the commission will have to again postpone the proposed advances in freight rates, both in eastern and western territory, because of lack of time to reach a decision on questions before the commission. It is expected that the roads will make a postponement voluntarily, thus making it unnecessary to issue an order.

Commissioner Clark conducted a hearing at Chicago last week in the case brought by the Crescent Coal & Mining Company against the Baltimore & Ohio for reparation, because the latter charged it demurrage at the rate of $1 per car per day on the cars which the Baltimore & Ohio had brought to Chicago for delivery to the Chicago, Milwaukee & St. Paul, but which the St. Paul, under its regulating embargo, refused to take. Shippers of coal claim that between $300,000 and $400,000 have been collected from them in the last two or three years for delays to cars which have not been the fault of either the shipper or the consignee. Counsel for the Chicago Coal Dealers' Association charged that demurrage is assessed without any investigation on the part of the railways as to whether or not the consignees are prepared to receive delivery of the cars, and that in addition to

the demurrage collected the delays are costly to shippers and consignees. Witnesses for the St. Paul explained that its regulating embargo was adopted for the purpose of preventing the bunching of coal shipments in times of heavy traffic and bad weather, and was really a benefit to the shippers. Commissioner Clark raised the question of why shippers had got an injunction from a state court to restrain the St. Paul from enforcing its embargo when interstate tariffs were involved. It was explained that the injunction had been modified by stipulation of attorneys and it was still further modified by the decision which may be rendered by the Interstate Commerce Commission.

Reparation Awarded.

Hydraulic-Press Brick Co. v. St. Louis & San Francisco et al. Opinion by Commissioner Clark:

Rate on enameled brick found unreasonable. (19 I. C. C. 554.)

J. H. Day Co. v. Baltimore & Ohio Southwestern et al. Opinion by Commissioner Lane:

Complainant's shipments of iron drying racks from Brighton, Ohio, to St. Louis. Mo., were given an improper classification. (19 I. C. C. 577.)

Cleary Brothers v. Chicago & North Western et al. Opinion by Commisisoner Lane:

Rates on beer and other beverages from Milwaukee, Wis., to Gladstone, Mich., and Escanaba, found unreasonable. (19 I. C. C. 588.)

William K. Noble v. St. Louis Southwestern et al. Opinion by Commissioner Prouty:

Unreasonable rate and weight charged for the transportation of one carload of coiled elm hoops from Bell City, Mo., to Jacksonville, Fla. (20 I. C. C. 62.)

McCaull-Dinsmore Co. v. Chicago, Milwaukee & St. Paul et al. Opinion by the commission:

Rate of 75 cents for transportation of mixed carload of cracked corn and whole corn from Elk Point, S. D., to Anaconda, Mont., found unreasonable and rate of 55 cents established for future. (20 I. C. C. 15.)

Albert Steinfeld & Co. v. Illinois Central et al. Opinion by Commissioner Cockrell:

Joint rate of $1.22 on laundry soap from St. Louis, Mo., to Nogales, Ariz., in force on the date shipment moved, found in view of the circumstances of this case, to be unreasonable at that time. (20 I. C. C. 12.)

DuMee, Son & Co. v. Alabama, Tennessee & Northern. Opinion by Commissioner Lane:

Defendants' rates on compressed cotton linters in carloads, released to a valuation of 2 cents per pound, from Aliceville, Ala., to Philadelphia, Pa., found unreasonable, and reparation awarded. (19 I. C. C. 575.)

Texico Transfer Co. v. Louisville & Nashville et al. Opinion by the commission:

The originating carrier filed a tariff naming a through joint rate. Connecting lines named therein had not concurred, and a higher combination rate was therefore applicable. The combination rate found to be unreasonable and reparation awarded against originating carrier. (20 I. C. C. 17.)

Oregon Lumber Co. v. Oregon Railroad & Navigation Co. et al. Opinion by Commissioner Lane:

A carload of lumber shipped from Baker City, Oregon, to Mammoth, Utah, was loaded to the maximum in bulk permitted by the restrictions of the carrier; the weight of the load was less than the rated minimum of the car, and charges were assessed on the basis of such minimum. The charges should have been on the actual weight. (19 I. C. C. 582.)

Bowles & McCandless v. Louisville & Nashville. Opinion by Chairman Knapp:

Through an error in printing the tariff of the railway, the rate on double-deck sheep cars was shown as $134, where it should have been $44. The rate on single-deck sheep cars was shown correctly at $44. The complainants, therefore, ordered twice as many single-deck sheep cars as they would have needed double-deck cars and were therefore charged $88 for a shipment that should have cost them $44. (19 I. C. C., 563.)

Reparation Denied.

William K. Noble v. Detroit & Toledo Shore Line et al. Opinion by Commissioner Prouty:

Complainant asks reparation on one carload of coiled elm hoops from Newport, Mich., to New York City, based on incorrect weight. Defendants' weighmaster's certificate shows a weight of 66,000 lbs., but complainant contends that the weight did not exceed 56,000 lbs., based on estimated weight of 475 lbs. per 1,000 hoops. The secondary evidence introduced by complainant was not sufficient to establish that this shipment was not properly and accurately scaled. (20 I. C. C. 60.)

William K. Noble v. Grand Trunk Western et al. Opinion by Commissioner Prouty:

Complainant asks reparation on shipment of coiled elm hoops from Mount Clemens, Mich., via Norfolk, Va., to Ripplemead, Va., on a combination rate of 26 cents per 100 lbs. Subsequently a specific rate from Mount Clemens to Norfolk was published. Reparation is demanded on the basis of the through Ripplemead rate of 21½ cents. As the later tariffs could not be used until the commission's tariff rules had been complied with, there is no basis for an order of reparation. Such order should be made upon affirmative evidence that the rate complained of is unreasonable or unjustly discriminatory, which does not appear in this case. (20 I. C. C. 70).

O'Brien Commercial Co. v. Chicago & North Western et al. Opinion by Commissioner Prouty:

Complainant asks reparation on a shipment of furniture and framed wall looking-glasses, shipped in one car, from Rockford, Ill., to San Francisco, Cal. Charges were collected on the furniture on the minimum weight and on the looking-glasses at the actual weight, whereas complainant alleges that the charges should have been made on the actual weight of the entire shipment. As the looking-glasses were not to be used in connection with the furniture, the provisions in the tariffs were properly applied, and that the complaint should be dismissed.

No opinion is expressed as to whether the assignee of a claim for reparation can maintain proceedings in his own name before the commission. (20 I. C. C. 68.)

Rates on Cotton Seed and Cottonseed Products Reasonable.

East St. Louis Cotton Oil Co., v. St. Louis & San Francisco et al. Opinion by Commissioner Clements.

1. Complaint questions reasonableness of rates on cottonseed in carloads from points mainly in Oklahoma, Arkansas, Mississippi, Tennessee, and Missouri to East Et. Louis, Ill., and also alleges unjust discrimination in the relationship of such rates as compared with rates on cottonseed products from the same points of origin at which cottonseed oil mills are located to East St. Louis and to points beyond, principally in Illinois, Indiana, Ohio, Michigan and Wisconsin. The rates applicable to each kind of traffic necessarily must be made with reference to the facts, circumstances, and conditions governing the production, transportation, and marketing of the respective products, and from the record in this case the commission is unable to find that the charges on cottonseed products afford a strict measure for the reasonableness of the rate on cottonseed. In the light of the facts and conditions affecting the particular traffic, the commission does not find the rates here involved to be unreasonable.

2. The general rule is that manufactured products bear higher rates of transportation than does raw material, and it is founded in reason, because ordinarily there is a substantial difference between the value of the one and that of the other, and frequently there is a greater degree of risk incident to the transportation and care of the manufactured product than of the raw material. 3. This general rule is not universal, and is departed from in some instances because the reasons for the distinction are lacking, and in other cases because of countervailing commercial and market conditions and considerations.

4. Respecting contention of complainant concerning its disadvantage because of distance, and that of interveners as to allowing mills in the cotton territory to crush the seed. It is held that it is not the duty of this commission to equalize the profit-and-loss results of competing operations in different localities by overcoming natural and commercial conditions with rate adjustments. (20 I. C. C. 37.)

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF NOVEMBER, 1910.

Name of road.	Mileage operated at end of period.	Operating revenues			Operating expenses						Net operating revenue (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or dec.) comp. with last year.
		Freight.	Passenger.	Total, inc. misc.	Maintenance: Way and structures.	Maintenance: Of equipment.	Traffic.	Transportation.	General.	Total.					
Baltimore & Ohio	4,439*	$5,793,039	$1,214,681	$7,470,106	$819,981	$1,506,209	$162,598	$2,995,919	$162,018	$5,646,725	$1,823,381	—$21,497	$221,276	$1,580,608	—$671,331
Boston & Maine	2,243	2,339,648	1,165,017	3,785,327	448,560	473,494	29,536	1,711,215	88,024	2,750,829	1,034,498	6,306	186,513	854,291	—173,370
Central of Georgia	1,915	780,978	304,479	1,190,542	155,410	174,566	32,285	359,405	37,364	759,030	431,512	6,846	47,114	391,244	26,149
Central R.R. of New Jersey	631†	1,668,978	361,917	2,127,796	224,626	308,255	30,116	579,633	39,019	1,181,649	946,147	—18,397	95,915	831,835	—155,523
Chesapeake & Ohio	1,940	2,131,910	403,230	2,639,073	305,427	502,135	44,550	784,715	56,548	1,693,375	945,698	—548	76,750	868,401	—142,368
Chicago & Eastern Illinois	966	906,763	163,176	1,129,359	116,266	219,383	22,234	414,649	35,702	808,234	321,125	—1,553	32,000	287,572	—41,267
Chicago, Indianapolis & Louisville	616	321,596	121,894	487,569	75,265	74,260	15,119	183,830	16,869	365,343	122,226	.....	22,500	99,726	—77,954
Cincinnati, New Orleans & Texas Pacific	337	636,976	132,083	808,306	109,628	160,881	20,337	234,183	17,709	542,738	265,567	—1,894	21,500	242,173	—49,100
Cleveland, Cincinnati, Chic. & St. Louis	1,982	1,806,353	589,878	2,634,239	319,902	458,592	78,547	1,156,876	60,146	2,074,063	560,176	—9,926	82,000	468,250	—278,345
Colorado & Southern	1,181‡	732,944	107,317	882,988	78,045	169,038	10,970	275,144	21,367	554,564	328,424	—1,919	24,700	301,805	—29,607
Denver & Rio Grande	2,553	1,709,019	412,587	2,210,051	246,963	375,563	44,797	744,452	46,280	1,458,055	751,996	—6,327	70,000	675,669	65,273
Galveston, Harrisburg & San Antonio	1,338	754,011	238,724	1,044,636	124,660	141,936	26,329	353,272	29,456	675,653	368,983	—2,268	29,200	337,515	—40,609
Great Northern	7,274§	4,117,536	1,122,074	5,623,009	459,944	669,012	87,374	1,640,691	94,220	2,951,241	2,671,768	8,613	264,299	2,416,082	—435,108
Gulf, Colorado & Santa Fe	1,518	946,850	272,525	1,293,865	198,473	169,714	23,859	426,536	34,817	853,399	440,466	.....	32,325	408,141	18,974
Illinois Central	4,550	3,750,837	1,028,582	5,383,868	589,903	1,042,166	111,859	1,855,775	115,924	3,715,627	1,668,241	—7,295	211,952	1,448,994	51,634
Kansas City Southern	827	694,464	138,900	921,557	87,957	111,199	29,336	304,953	30,607	564,052	357,505	.....	29,476	328,029	28,814
Lake Erie & Western	886	366,184	59,167	451,392	90,576	87,667	13,891	177,676	12,193	382,002	69,390	.....	19,091	50,299	—75,397
Lake Shore & Michigan Southern	1,663	2,683,366	816,706	4,016,487	697,498	590,590	104,475	1,512,468	82,558	2,987,589	1,028,898	—8,824	147,956	872,118	—629,766
Michigan Central	1,746	1,652,946	568,919	2,507,921	369,939	327,228	61,290	1,063,987	48,055	1,870,499	637,422	—5,647	94,000	537,775	—283,077
Mobile & Ohio	1,114	744,182	121,500	1,003,175	121,639	157,638	30,448	322,218	34,932	666,875	336,300	—1,449	25,460	309,391	—44,208
Nashville, Chattanooga & St. Louis	1,230	760,302	222,873	1,050,184	161,443	198,078	33,130	361,595	26,957	781,203	268,981	—510	22,287	246,184	—16,556
New York Central & Hudson River	3,588	5,280,516	2,256,971	8,453,952	1,108,235	1,401,075	188,069	3,269,662	187,252	6,154,293	2,299,659	38,496	440,996	1,897,159	—515,950
New York, New Haven & Hartford	2,041	2,672,063	2,130,163	5,285,897	570,327	598,967	29,940	2,069,211	146,122	3,414,567	1,871,330	125,542	250,000	1,746,871	8,820
New York, Ontario & Western	546	647,991	89,579	760,571	89,761	124,788	11,323	315,077	17,885	558,834	201,737	—9,792	17,500	174,445	—12,725
Oregon R.R. & Nav. Co	1,489¶	1,042,323	348,150	1,490,473	161,437	127,038	30,413	493,240	35,087	847,215	643,258	—537	59,227	583,494	111,501
Oregon Short Line	1,595‖	1,439,000	399,631	1,951,641	211,542	184,224	27,123	470,768	42,306	935,963	1,015,678	—3,336	62,044	950,298	—139,929
Philadelphia & Reading	1,022	3,291,450	574,600	4,024,924	296,634	775,426	42,797	1,239,149	64,190	2,418,196	1,606,728	38,113	84,085	1,560,756	31,882
St. Louis Southwestern	769	620,764	122,764	776,839	90,335	107,031	28,025	173,589	22,255	421,235	355,604	—685	18,933	335,986	47,562
St. Louis Southwestern of Texas	703	316,961	92,506	432,862	102,522	76,036	10,171	171,798	16,947	377,474	55,388	—283	8,333	46,772	29,410
San Pedro, Los Angeles & Salt Lake	1,105	461,682	199,027	708,717	96,272	102,413	30,135	256,439	17,390	502,649	206,068	—5,876	29,735	170,457	47,879
Seaboard Air Line	3,028*a*	1,345,702	358,847	1,893,460	239,469	255,470	62,487	617,007	51,722	1,226,155	667,305	216	65,000	602,521	39,989
Southern Pacific Company	6,193*b*	5,140,558	2,559,625	8,197,622	1,085,550	977,693	137,742	2,059,085	227,698	4,487,768	3,709,854	50,979	275,054	3,485,779	—412,341
Southern Ry.	7,038	3,699,304	1,248,706	5,351,622	684,845	788,085	133,476	1,715,835	146,732	3,468,973	1,882,649	1,272	185,053	1,698,867	79,564
Texas & Pacific	1,884	1,300,244	341,652	1,718,888	145,040	258,816	19,491	594,880	35,412	1,053,639	665,249	—2,528	85,477	577,244	17,862
Union Pacific	3,473*c*	3,692,546	920,874	4,985,427	359,208	482,696	128,666	1,258,591	111,697	2,340,859	2,644,568	—13,849	160,300	2,470,419	—171,547
Yazoo & Mississippi Valley	1,372	865,736	256,739	1,190,029	166,814	115,775	14,358	301,319	25,557	623,823	566,206	—567	32,942	532,697	153,815

FIVE MONTHS OF FISCAL YEAR 1911.

Baltimore & Ohio	4,439*	$30,569,219	$7,291,071	$40,154,550	$5,160,318	$7,252,545	$891,217	$14,233,503	$779,472	$28,317,055	$11,837,495	—$2,729	$1,074,222	$10,760,544	—$1,266,068
Boston & Maine	2,243	11,006,718	7,538,029	20,001,219	2,792,093	2,368,810	230,789	8,442,451	440,022	14,274,165	5,727,054	30,142	882,983	4,874,213	—842,877
Central of Georgia	1,915	3,497,613	1,532,070	5,486,494	784,829	896,361	165,321	1,663,627	190,377	3,700,515	1,785,979	34,270	227,064	1,593,185	—35,219
Central R.R. of New Jersey	631†	7,497,122	2,185,662	10,186,256	1,148,429	1,583,773	161,789	2,906,788	193,516	5,994,295	4,191,961	140,621	480,486	3,852,096	—349,456
Chesapeake & Ohio	1,940	10,594,726	2,458,621	13,584,134	1,682,011	2,482,343	224,445	3,847,892	297,400	8,534,091	5,050,043	—12,549	383,750	4,653,744	—430,543
Chicago & Eastern Illinois	966	4,144,204	940,605	5,407,659	565,209	974,358	123,632	1,867,111	161,515	3,691,825	1,715,834	—8,427	157,900	1,549,507	—87,724
Chicago, Indianapolis & Louisville	616	1,811,502	716,098	2,747,771	364,846	363,323	83,508	921,474	72,880	1,806,031	941,740	.....	112,500	829,240	—88,656
Cincinnati, New Orleans & Texas Pacific	337	3,097,393	711,058	4,001,133	437,697	694,074	100,862	1,069,654	88,566	2,390,853	1,610,280	—3,961	107,500	1,498,819	240,021
Cleveland, Cincinnati, Chic. & St. Louis	1,982	8,634,536	3,710,896	13,492,699	1,911,446	2,287,175	451,426	5,494,785	282,771	10,427,603	3,065,096	—38,676	410,000	2,616,420	—1,308,421
Colorado & Southern	1,181‡	3,317,569	808,710	4,334,065	549,001	836,095	60,141	1,353,214	109,949	2,908,400	1,425,665	—5,414	123,500	1,296,751	—87,833
Denver & Rio Grande	2,553	7,922,757	2,615,579	11,002,248	1,422,229	1,758,610	252,143	3,546,147	239,072	7,218,201	3,784,047	1,497	350,000	3,435,545	14,681
Galveston, Harrisburg & San Antonio	1,338	3,381,412	1,124,104	4,738,941	628,034	710,807	128,234	1,659,821	140,573	3,267,469	1,471,472	—18,909	146,000	1,306,563	—8,608
Great Northern	7,274§	21,801,724	6,439,203	30,165,350	4,337,578	3,289,845	438,564	7,887,799	481,606	16,435,392	13,729,958	140,612	1,444,593	12,425,977	—1,548,092
Gulf, Colorado & Santa Fe	1,518	3,715,938	1,422,408	5,471,444	922,301	760,669	120,531	1,947,190	158,569	3,909,260	1,562,184	.....	161,625	1,400,559	51,361
Illinois Central	4,550	17,256,304	5,705,494	26,007,624	3,673,889	5,418,412	554,850	8,459,092	519,015	18,625,258	7,382,366	—34,392	1,023,591	6,324,383	1,492,494
Kansas City Southern	827	3,262,173	722,445	4,408,503	452,724	552,779	129,878	1,429,679	139,936	2,704,996	1,703,507	.....	147,382	1,556,125	353,236
Lake Erie & Western	886	1,879,323	441,515	2,454,154	409,114	447,314	87,194	894,685	59,957	1,898,264	555,890	.....	94,671	461,219	—182,065
Lake Shore & Michigan Southern	1,663	13,916,516	5,298,149	21,602,746	3,690,583	3,272,053	533,511	7,208,461	387,977	15,092,585	6,510,161	—23,302	739,783	5,747,076	—2,221,544
Michigan Central	1,746	8,173,500	3,675,417	13,129,921	2,076,569	1,850,249	395,097	5,114,880	242,882	9,679,677	3,450,244	—19,205	528,450	2,902,589	—1,176,635
Mobile & Ohio	1,114	3,318,471	609,766	4,552,277	546,018	768,077	166,781	1,554,415	162,410	3,197,701	1,354,576	—9,237	123,700	1,221,638	—8,904
Nashville, Chattanooga & St. Louis	1,230	3,374,542	1,254,114	4,923,466	737,247	926,870	174,888	1,749,795	124,683	3,713,482	1,209,984	—2,812	111,435	1,095,737	—81,208
New York Central & Hudson River	3,588	24,911,817	14,600,019	44,054,574	6,297,290	6,966,377	1,070,845	15,713,853	1,111,298	31,159,663	12,894,911	—6,043	1,997,213	10,891,655	—1,451,174
New York, New Haven & Hartford	2,041	13,006,425	11,974,699	27,332,310	3,220,645	2,958,371	146,484	10,028,619	712,966	17,067,084	10,265,226	620,344	1,592,000	9,293,570	—188,997
New York, Ontario & Western	546	3,104,787	974,550	4,243,232	519,549	605,396	60,354	1,492,212	84,266	2,761,777	1,481,455	—22,527	87,500	1,371,428	200,853
Oregon R.R. & Nav. Co	1,489¶	4,693,672	1,967,084	7,094,655	973,800	648,524	154,434	2,339,195	166,541	4,282,494	2,812,161	3,444	296,135	2,519,470	—642,746
Oregon Short Line	1,595‖	6,726,740	2,375,476	9,627,272	1,318,559	915,973	154,697	2,218,244	216,834	4,824,307	4,802,965	—2,194	309,860	4,490,911	—766,653
Philadelphia & Reading	1,022	14,550,067	3,131,173	18,509,618	1,785,657	3,414,389	224,569	5,762,165	334,881	11,521,661	6,987,957	95,336	420,833	6,662,460	—137,652
St. Louis Southwestern	769	7,581,991	602,681	3,326,439	354,787	525,073	133,622	827,271	107,093	1,947,846	1,378,593	—4,926	94,666	1,279,001	—50,792
St. Louis Southwestern of Texas	703	1,368,145	482,173	1,962,282	446,028	355,712	52,336	797,808	79,668	1,731,551	230,731	—1,182	41,667	187,882	21,261
San Pedro, Los Angeles & Salt Lake	1,105	1,986,212	1,156,623	3,350,373	663,006	485,227	150,385	1,171,493	80,942	2,551,053	799,320	—22,651	130,451	646,218	—318,044
Seaboard Air Line	3,028*a*	5,665,655	1,858,559	8,388,307	1,205,873	1,141,943	296,265	2,819,851	242,422	5,706,354	2,681,953	—7,552	325,000	2,349,401	36,529
Southern Pacific Company	6,193*b*	24,691,539	14,146,848	41,516,777	4,921,415	5,084,174	799,020	10,506,083	1,125,173	22,435,865	19,080,912	227,183	1,375,269	17,932,826	—1,565,772
Southern Ry.	7,038	16,643,453	7,111,369	25,666,134	3,189,615	4,182,471	645,818	8,304,753	700,827	17,023,484	8,642,650	7,548	884,993	7,765,205	180,838
Texas & Pacific	1,884	4,866,037	1,812,947	7,181,960	854,598	1,346,153	105,726	2,692,708	175,035	5,174,220	2,007,740	—13,237	250,204	1,744,299	212,560
Union Pacific	3,473*c*	17,874,324	5,212,498	24,906,611	2,537,112	2,550,955	539,350	5,940,475	544,835	12,112,727	12,793,884	—6,289	745,900	12,041,695	—739,643
Yazoo & Mississippi Valley	1,372	2,975,437	1,089,257	4,335,617	956,742	706,307	74,552	1,339,323	114,908	3,191,832	1,143,785	—3,029	164,942	975,814	362,636

Mileage operated on November 30, 1909.—* 4,460 miles; † 668 miles; ‡ 1,249 miles; § 7,037 miles; ¶ 1,327 miles; ‖ 1,509 miles; *a* 2,987 miles; *b* 6,061 miles; *c* 3,384 miles. — Indicates Deficits, Losses and Decreases.

Not Liable for Fire on Private Spur.

Imperial Wheel Co., v. St. Louis, Iron Mountain & Southern et al. Opinion by Commissioner Harlan.

Upon complaint that the defendant refuses to make a connection with the petitioner's spur track leading to its plant and to operate the track except upon condition that the petitioner shall first release it from liability for loss and damage by fire on the premises caused by sparks and coals from the defendant's locomotives while on the spur track. If the defendant goes beyond its common-law duty as a carrier and undertakes to operate a spur track, doing this for the convenience of the shipper, and in this case without additional charge, such a requirement on its part is not unreasonable. It has no control over the complainant's premises and connot police them or take other steps to avoid the danger of fire. Under such circumstances it may protect itself against the hazard of fire and consequent loss and damage to the petitioner's property by attaching reasonable conditions to its undertaking to operate the spur track. (20 I. C. C. 56.)

Another Coal Car Distribution Case.

James H. Minds and Julia A. Matz, trading as the Bulah Coal Co. v. Pennsylvania Railroad. James H. Minds, surviving and liquidating partner of James H. Minds and William J. Matz, lately trading as the Bulah Coal Co. v. same. Opinion by Commissioner Harlan:

Upon complaint that the defendant's system of rating mines and distributing its coal-car equipment is discriminatory, it is so found, and *Hillsdale Coal & Coke Co. v. P. R. R. Co.*, 19 I. C. C. Rep., 356, and the other cases in that group of cases, are cited and reaffirmed. The question of damages is reserved for further argument. (20 I. C. C. 52.)

Bad Advice Caused Misrouting.

Independent Supply Co. v. Cumberland & Pennsylvania Railroad et al. Opinion by Commissioner Prouty:

Complainant seeks reparation on four carloads of blacksmith coal shipped from West Virginia points to Los Angeles, Cal., on the ground that the shipments were misrouted. As the shipments were routed in accordance with specific instructions, the fact that one of the defendants advised the routing can not be the basis on which to order reparation. *Poor Grain Co. v. C., B. & Q.*, 12 I. C. C. 545, followed. (20 I. C. C. 66.)

Cotton Seed Rates Reduced.

Memphis Freight Bureau, v. St. Louis Southwestern. Opinion by Commissioner Harlan.

Rates on cotton seed from points on defendant's lines in Missouri, Arkansas, and Louisiana to Memphis found to be unreasonable, and also unduly discriminatory in their relation to rates from the same points to East St. Louis. Reasonable rates established. (I. C. C. 33.)

Anadarko Cotton Oil Co. et al, v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner Clements.

Rate on cottonseed oil from certain Oklahoma points to Galveston, Tex., of 31¼ cents found unreasonable to the extent that it exceeds 27½ cents. Rate on cottonseed oil from Ardmore, Durant, Madill, and Tishomingo, Okla., to Galveston, Tex., found unreasonable to the extent that it exceeds 22½ cents. Respecting the refining-in-transit privilege at Dallas, Greenville, Sherman, and Fort Worth, Tex., on oil for export through Galveston, the commission does not endeavor to establish or extend transit privileges in the absence of discrimination, proof of which in this case is wanting; but in a recent tariff the privilege here asked for apparently has been granted. Present rates on cotton seed from Tishomingo, Ardmore, Durant, Madill, and Roff, Okla., to certain points in Texas found unreasonable to the extent that they exceed the rates declared reasonable in the report. Blanket rate on cottonseed oil from all the remaining Oklahoma points involved to certain Texas points found unreasonable to the extent that it exceeds the rate named in the report. Carriers allowed the option either to reduce the group rates on cottonseed oil substantially in accordance with suggestions made in the report, retaining the grouping, or to comply with the suggestions of changing the grouping to some extent. Defendants allowed ninety days within which to present a scheme of rate adjustment in substantial conformity with this report.

A rate reasonable in view of the circumstances and conditions when it is established may, in course of time, become unreasonable by virtue of changed circumstances and conditions. It is manifestly impracticable for the carriers or the commission in such a case to determine at what exact time in the gradual process of changes the rate becomes unreasonable. Neither does it seem that the bona fide action of the carrier in the necessary exercise of their judgment within reasonable limits should always be at their peril of liability for reparation for the difference between rates initiated on their judgment and later changed on the judgment of the commission. Therefore, the awarding of reparation by no means necessarily follows the reduction of a rate, whether by the voluntary action of the carriers or by order of the commission. Whatever may be the nature of the fact, circumstances, and conditions appearing in a particular case where reparation is involved, whether on account of excessive rates or by reason of unjust discrimination, there must be that degree of certainty and satisfactory conviction in the mind and judgment of the commission as would be deemed necessary under the well-established principles of law as a basis for judgment in court. Applying these principles to this case the report herein should not be regarded as a basis for reparation. (20 I. C. C. 43.)

STATE COMMISSIONS.

Comments on the annual report of the New York Public Service Commission, First district, appear elsewhere in this issue.

The Railroad Commission of Texas has issued an order reducing the freight rates on cast iron pipe and on rails and rail fastenings.

The Railroad Commission of Michigan has notified those railways which do not use the block system, that the adoption of the system ought to be carried out immediately.

Prof. Henry Thurtell, a member of the State Railroad Commission of Nevada, has resigned to take a position with the Interstate Commerce Commission as examiner.

The New York Public Service Commission, Second district, has dismissed the complaint against the Coney Island & Brooklyn Railroad which asked the commission to order the company to charge a five-cent fare to Coney Island.

Archibald B. Millar, private secretary to Governor Stuart, has been elected secretary of the Pennsylvania State Railroad Commission to serve from February 1. He succeeds H. S. Calvert, resigned to become a receiver of a Pittsburgh trust company.

The Nebraska State Railway Commission has found that shipments of ginger ale, soda water, cider, etc., are made and returned at variable weights, some on the billing offered by the shipper, some on the weights guessed at by the railway agent and some at actual weights, and that this has produced discrimination as between different shippers. The commission has therefore adopted a scale of estimated weights.

The New York Public Service Commission, second district, has ordered the American Express Company and the Canadian Express Company to reduce their joint rates so as to make the through rate from points on the Canadian Express Company's line to points on the American Express Company's lines lower than the sum of the local rates. This order makes substantial reductions below the present rates on shipment of 100 lbs. or over and even larger reductions on shipments of less than 100 lbs.

The suit of the Indiana Commission in the Indianapolis Circuit Court asking the court to order Superintendent Houghton, of the Cleveland, Cincinnati, Chicago & St. Louis to give the commission the names, ages and addresses, length of service and records of all telegraph operators employed by the road in Indiana, has failed. The judge refused to grant the order. The commission sought this information following a collision at Brightwood, where it was reported the road was employing boys as operators. The court did not hold that the commission could

not obtain the desired information, but ruled that it had followed the wrong procedure, and he doubted if any court had the power to enforce such a request.

The New York Public Service Commission, second district, has made an order granting permission to the Pullman Company to revise its tariff of sleeping car charges within the state of New York. Where the lower berth rate is $1.50, the rate for the upper berth between the same points will be $1.25. Where the lower berth rate is $1.75 or more the rate for the upper berth between the same points will be 80 per cent. thereof. No change is to be made in the price for lower berths unless such change constitute a reduction from the rate now in force. The result of this order reduces the charge for upper berths from $1.50 to $125, from $2 to $1.60, and from $2.50 to $2. The reduction in rates becomes effective February 1, 1911.

The New York Public Service Commission, first district, has dismissed the complaint of Street & Smith, Ainslee's Magazine Company, et al., vs. the Interborough Rapid Transit, in a case in which the magazine companies asked the commission to order the Interborough to make such regulations in regard to the sale of magazines in the subway and elevated as to permit the sale of the plaintiff's publications. Ward & Gow now have the concession for the sale of papers in the subway and the elevated, and have refused to sell Street & Smith's and other magazines unless the plaintiffs would agree to increase the compensation paid to Ward & Gow. The complaint says that the defendant is compelled by its contracts, under which it operates the subways, to furnish its patrons with all reasonable service and facilities, and the sales of magazines comes under that head. The commission does not find this to be the case, and therefore holds that it has no jurisdiction in the matter.

COURT NEWS.

The decision of the Supreme Court in the Mutual Carriers' Liability case is reported at length elsewhere in this issue.

In the United States court at Buffalo, January 9, the Standard Oil Co. paid fines amounting to $23,766. These fines are for the acceptance of unlawful rates on oil shipped from Olean, N. Y., to points in Vermont over the Pennsylvania, the New York Central and the Central Vermont. This suit has been pending many years.

In the federal court at Buffalo, N. Y., January 10, a fine of $500 was imposed on the Michigan Central for violating the law limiting the number of hours that animals may be kept in cars. Judge Holt in delivering the opinion of the court said that the case was one of serious cruelty. Horses were confined in a car for over 40 hours without food or water, in extremely cold weather.

The supreme court of Oregon in the case of Martin v. the Oregon Railroad & Navigation Company, appealed from the court of Umatilla county has sustained the law of Oregon which requires railways to furnish, on demand, suitable cars for perishable freight, that is to say refrigerator cars. The claim was for damages of $2,258, for loss on apples; a loss caused by the failure of the road to furnish refrigerator cars for the shipment of the apples to Eastern points. The supreme court holds that the law in question is a proper exercise of the police power of the state. The claim that the law is an unreasonable regulation of interstate commerce is rejected.

FOREIGN RAILWAY NOTES.

The passenger and freight receipts of the North Western of Uraguay Railway Company for the past year were greater than any in the history of the company.

The most active railway construction work in northern Brazil is on the Northeastern Railway, by the South American Construction Company. Final government approval for about 100 miles of line covers 49 miles from M. Calmon to Iquatu, 13 miles for a branch to Cedro, and 37 miles for a branch connection between the Sobral and Baturite railways; total appropriation, $2,348,000.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

Thomas M. Pierce has been appointed general counsel of the Terminal Railroad Association of St. Louis, with office at St. Louis, Mo., succeeding M. F. Watts, resigned.

J. A. Hendry, assistant treasurer of the National Railways of Mexico at Mexico City, Mex., has been appointed general treasurer, with office at Mexico City, succeeding J. M. Frazier, deceased.

C. R. Staples has been appointed claim agent of the Buffalo & Susquehanna Railroad and the Buffalo & Susquehanna Railway, with office at Galeton, Pa., succeeding F. C. Herr, resigned to go to another company.

H. C. Nutt, vice-president of the Camas Prairie, has been elected president, with office at Tacoma, Wash., succeeding J. P. O'Brien, who has been elected vice-president, with office at Portland, Ore., succeeding Mr. Nutt.

W. J. Bienemann, auditor of the Kanawha & Michigan, has been appointed secretary, succeeding G. Morton, resigned, and W. N. King has been appointed general attorney, succeeding Norton Monsarratt, resigned, both with offices at Columbus, Ohio.

Bruce K. Scott, for five years professor of law at the Univeristy of Wisconsin, has been appointed general attorney of the Chicago, Burlington & Quincy, in charge of interstate commerce litigation, with office at Chicago. He succeeds to the office formerly held by Hale Holden, who has been assistant to the president since February, 1910.

John W. Newlean, whose appointment as general auditor of the Illinois Central, with office at Chicago, has been announced in these columns, was born October 28, 1875, in Chicago. He attended public and private schools at Omaha, Neb., and began railway work December 1, 1891, with the Burlington & Missouri River, now part of the Chicago, Burlington & Quincy, in the freight claim department. He went to the Union Pacific in March, 1892, serving for eight years in different capacities in the accounting department. He was then placed in charge of the pay department, and in July, 1901, was appointed to a position under the general auditor, later becoming chief clerk. He was appointed general auditor for the receivers of the Chicago Great Western in February, 1909, and when that road was reorganized in September, 1909, was appointed auditor, which position he resigned to accept his present office of general auditor of the Illinois Central, the Yazoo & Mississippi Valley and the Indianapolis Southern.

Operating Officers.

M. S. Meeks has been appointed general superintendent and manager of the North Yakima & Valley, with office at North Yakima, Wash.

George Hannauer, superintendent of the Indiana Harbor Belt, at Gibson, Ind., has been appointed general superintendent, and J. W. Callahan has been appointed assistant superintendent.

J. H. Nelson, manager and purchasing agent of the Jacksonville Terminal Company, has been appointed general superintendent of the Florida East Coast, with office at St. Augustine, Fla.

R. T. McGraw, trainmaster of the Denver & Rio Grande at Pueblo, Colo., has been appointed assistant superintendent of the First division, with office at Pueblo, succeeding W. H. Russell, deceased.

W. D. Hodge, chief engineer of the Denver, Laramie & Northwestern at Denver, Colo., has been appointed also general superintendent, with office at Denver, succeeding D. L. Hutchison, superintendent and assistant chief engineer, resigned.

F. E. Weymouth, superintendent of the Northern Pacific, with office at Seattle, Wash., has resigned to engage in other business. As has been announced in these columns, J. E. Craver

has been appointed superintendent of the Seattle division, succeeding Mr. Weymouth.

C. E. Hedrix, assistant superintendent of the St. Joseph & Grand Island, at St. Joseph, Mo., has been appointed superintendent, with office at St. Joseph, succeeding F. T. Slayton, resigned to accept service with another company.

C. E. Brooks, assistant superintendent on the Idaho division of the Oregon Short Line at Pocatello, Idaho, has had his jurisdiction extended over Pocatello yard in addition to the Third district. C. J. Husted, also assistant superintendent at Pocatello, has had his jurisdiction extended to include the Second district, and the office of assistant superintendent G. J. Cunningham at Pocatello has been abolished. J. E. Davis, chief despatcher at Kemmerer, Wyo., has been appointed chief despatcher, with office at Pocatello, succeeding T. C. Collopy, resigned. J. P. Folger succeeds Mr. Davis.

H. H. Morris, trainmaster of the Kanawha coal district of the Chesapeake & Ohio, at Handley, W. Va., has been appointed superintendent of the Huntington division, with office at Huntington, succeeding C. P. Snow, resigned to go into other business. J. B. Harris has been appointed superintendent of the Hinton division, with office at Hinton, succeeding J. R. Cary, promoted. W. R. Turner has been appointed assistant to H. H. Morris, superintendent of the Huntington division, with office at Huntington. E. L. Bock succeeds Mr. Morris, with office at Handley. F. Hatfield has been appointed trainmaster of the Russell, Ky., terminal, and R. K. Meherin has been appointed assistant trainmaster of the Cabin Creek branch, with office at Cabin Creek Junction, W. Va.

As has been announced in these columns, C. P. Stembel, superintendent of the Eastern division of the Minneapolis & St. Louis at Minneapolis, Minn., has had his jurisdiction extended over the entire line, and the office of superintendent of the Western division at Watertown, S. D., has been abolished. Incident to this change in the operating organization, R. E. Ryan, trainmaster of the Iowa Central at Marshalltown, Iowa, has been appointed assistant superintendent of the Western lines of the Minneapolis & St. Louis, with office at Watertown. J. P. Houston, trainmaster at Cedar Lake, Minn., has been appointed assistant superintendent, with office at Ft. Dodge, Iowa, succeeding E. P. Lovell, trainmaster, resigned. R. D. Howie has been appointed trainmaster of the line between Minneapolis and Ft. Dodge, with office at Cedar Lake, succeeding Mr. Houston. H. E. Jones, trainmaster at Watertown, S. D., has been transferred to Marshalltown, succeeding Mr. Ryan.

J. Walter Coon, whose appointment as assistant to general manager of the Baltimore & Ohio, with office at Baltimore, Md., has been announced in these columns, was born January 7, 1872, at Warren, Ill. He was educated in the Chicago high school, and began railway work February 5, 1886, with the Baltimore & Ohio as clerk, and was later file clerk and assistant accountant in the general superintendent's office at Chicago, remaining at Chicago until 1897, when he was transferred as assistant accountant and assistant chief clerk, to Newark, Ohio. In July, 1900, he was appointed accountant at Baltimore, Md., and in March, 1902, was made assistant chief clerk to the general manager. The following year he was made chief clerk to general manager, and in January, 1905, he was appointed chief clerk to third vice-president. Four years later he was appointed assistant to third vice-president, which position he held at the time of his recent appointment as assistant to general manager. His former position of assistant to third vice-president has been abolished.

J. W. Coon.

Chester T. Dike, whose appointment as general superintendent of the Chicago & North Western has been announced in these columns, was born August 13, 1871, at Woodstock, Ill. He graduated as a civil engineer from Cornell College in 1893, and three years previous he had begun railway work with the Northern Pacific. He was employed in various capacities until 1898, when he was made chief engineer of the Iowa, Minnesota & Northwestern, a subsidiary of the Chicago & North Western. In July, 1899, he was made resident engineer of the Chicago & North Western, in charge of construction of the Iowa, Minnesota & Northwestern, and he continued in the engineering department as resident, and then as division engineer until August, 1907. He was then made superintendent of the Pierre, Rapid City & North Western, where he remained for two years, becoming engineer and superintendent of construction of the Chicago & North Western at Pierre, S. D., in July, 1909. In November, 1910, he was promoted to general superintendent of the Minnesota and Dakota divisions of the Chicago & North Western, of the Pierre, Rapid City & North Western, and of the Pierre & Fort Pierre Bridge Railway, with office at Huron, S. D.

Chester T. Dike.

Traffic Officers.

L. G. Parsons has been appointed a commerical agent of the Louisville & Nashville, with office at Indianapolis, Ind.

H. S. Wineland has been appointed a traveling freight agent of the Missouri, Kansas & Texas, with office at Pittsburgh, Pa.

George Breckenridge has been appointed traveling freight and passenger agent of the Northern Pacific, with office at Spokane, Wash.

W. J. Gillerlain has been appointed a traveling passenger agent of the Canadian Pacific, with office at Cincinnati, Ohio, succeeding M. E. Malone, transferred.

F. M. Jenifer, assistant to the traffic manager of the Tonopah & Tidewater at Los Angeles, Cal., has been appointed general freight and passenger agent, a new office.

C. J. Kays, general agent in the passenger department of the Chicago & Alton, with office at Denver, Colo., has resigned to become city passenger agent of the Missouri, Kansas & Texas at Chicago.

J. B. Shackleford has been appointed general freight and passenger agent of the Abilene & Southern, with office at Abilene, Texas, succeeding E. P. Huddleston, resigned to accept service with another company.

Nelson Reed has been appointed agent of the Chicago, Indianapolis & Louisville, with office at Lafayette, Ind., succeeding W. K. Lucas, whose resignation as general agent has been announced in these columns.

William E. Farris has been appointed assistant general freight and passenger agent of the Buffalo & Susquehanna Railroad and the Buffalo & Susquehanna Railway, with office at Du Bois, Pa., succeeding M. J. McMahon

F. N. Hodgin, agent of the Cincinnati, Hamilton & Dayton at Indianapolis, Ind., has been appointed traveling freight agent, with office at Indianapolis, succeeding Earl Barnett, appointed local freight agent at Indianapolis.

Elmer L. Millflagle has been appointed passenger, baggage and freight agent of the Western Pennsylvania division of the Pennsylvania Railroad, with office at Vance Mill Junction, Pa., succeeding Homer S. Tarr, resigned.

J. W. Hodgen has been appointed a traveling freight agent of the Chicago & Eastern Illinois and the Evansville & Terre Haute, with office at Evansville, Ind., succeeding E. L. Cory, appointed local freight agent at Terre Haute, Ind.

R. C. Clayton, city ticket agent of the Canadian Pacific at Philadelphia, Pa., has been appointed a traveling passenger agent, with office at New York, in charge of the territory from New York to Florida. W. H. Jones succeeds Mr. Clayton.

H. P. Horton, city ticket agent of the Norfolk & Western, at Columbus, Ohio, has been appointed a passenger agent, with office at Columbus, and B. W. Herrman has been appointed general agent, at Cincinnati, succeeding L. V. Finkle, deceased.

R. B. Moore has been appointed an assistant general freight agent of the Atlanta, Birmingham & Atlantic, with office at Atlanta, Ga. W. I. Middleton, traveling freight agent at Atlanta, has been appointed a commercial agent, with office at Macon, Ga.

J. B. Hayes, commercial agent of the Wabash, with office at East St. Louis, Ill., has had his jurisdiction extended to include Alton, Ill., territory, and correspondence relating to business in that territory should be addressed to him as commercial agent at Alton, Ill.

George W. Hinckley, traveling freight agent of the New York Central Lines at Kansas City, Mo., has resigned to engage in other business, and F. W. McCoy, also traveling freight agent at Kansas City, succeeds Mr. Hinckley. Henry P. Gutler, contracting freight agent, succeeds Mr. McCoy, and H. F. Kleine succeeds Mr. Cutler.

William Simmons, chief rate clerk of the Southern Pacific Company, Atlantic Steamship Lines, at New York, has been appointed assistant general freight agent. G. J. Brady, chief clerk, has been appointed assistant general eastern freight agent, and C. W. Evans, chief soliciting agent, has been appointed a commercial agent, all with offices at New York.

R. S. Ruble, assistant general passenger agent of the Union Pacific at Omaha, Neb., has been transferred to Denver, Colo., in charge of passenger traffic in Colorado, except points on the main line; in New Mexico; on the Colorado division to and including Cheyenne, Wyo., and on the line westward from Cheyenne to and including Ogden, Utah. F. B. Choate, general agent at Denver, will have charge of freight traffic only. W. K. Cundiff has been appointed assistant general passenger agent at Omaha, succeeding Mr. Ruble.

C. C. Griggs, assistant general freight agent of the Michigan Central at Detroit, Mich., has been appointed chief of the tariff bureau, with office at Detroit, succeeding T. E. Eisman, deceased. As has been announced in these columns, George M. Weaver succeeds Mr. Griggs. W. C. Lewis, assistant general freight agent at Chicago, has been appointed a division freight agent, with office at Chicago; J. H. Brown, assistant general freight agent at Bay City, Mich., has been appointed a division freight agent, with office at Bay City, and the office of assistant general freight agent has been abolished at Chicago and at Bay City. Mr. Griggs has been appointed also chief of the tariff bureau of the Detroit & Charlevoix.

Walter Nichols, assistant general freight agent of the Cleveland, Cincinnati, Chicago & St. Louis, and the Cincinnati Northern at St. Louis, Mo., has been appointed a division freight agent, with office at St. Louis, and his former office is abolished. Ford Woods, assistant general freight agent at Indianapolis, Ind., has retired, and the office of assistant general freight agent at that place has been abolished. C. R. Lewis, general agent at Indianapolis, has been appointed a division freight agent, with office at Indianapolis, a new office. J. W. Clark has been appointed a division freight agent, with office at Cleveland, Ohio, succeeding George Krause, Jr., promoted. J. W. Hewson has been appointed a division freight agent, with office at Jackson, Mich., a new office.

James L. Clark, general western freight agent of the Lake Shore & Michigan Southern, the Dunkirk, Allegheny Valley & Pittsburgh, and the Lake Erie, Alliance & Wheeling at Chicago, has been appointed a division freight agent, with office at Chicago. E. L. Talcott, general eastern freight agent at Buffalo, N. Y., has been appointed a division freight agent, with office at Buffalo, and the office of general western freight agent at Chicago, and that of general eastern freight agent at Buffalo have been abolished. B. J. Torbron, general agent of the Lake Shore, the Lake Erie & Western, the Toledo & Ohio Central and the Zanesville & Western at Pittsburgh, Pa., has been appointed division freight agent of the Lake Shore, the Pittsburgh & Lake Erie, the Dunkirk, Allegheny Valley & Pittsburgh and the Lake Erie, Alliance & Wheeling, with office at Youngstown, Ohio, succeeding G. M. Kridler, promoted.

Hugh G. L. Campbell, who has been appointed assistant general freight agent of the Toledo & Ohio Central and the Zanesville & Western, with office at Toledo, Ohio, as was previously announced in these columns, was born January 5, 1875, at Buffalo, N. Y. He received a grammar school education at Buffalo, and began railway work in 1892 with the New York Central at East Buffalo. He was rate inspector for the joint rate inspection bureau from 1894 to 1898, and was employed by the Central Railway Clearing House at Buffalo from 1899 to 1902. He then became traveling freight agent of the Lake Erie & Western, and in 1907 became agent of the Merchants' Despatch at Rochester, N. Y. He was appointed commercial agent of the New York Central Railroad and fast freight lines in January, 1908, and in June of the following year was made division freight agent of the Lake Erie & Western at Sandusky, Ohio, from which position he was recently promoted.

C. H. Jackson has been appointed general agent of the Cleveland, Cincinnati, Chicago & St. Louis, with office at Indianapolis, Ind., succeeding C. R. Lewis, promoted. L. J. Blaker has been appointed a soliciting freight agent and J. E. Pierce, a dairy agent, both with office at Indianapolis. Charles H. King has been appointed general agent, with office at Cincinnati, Ohio, succeeding George Metzger, assigned to other duties. T. M. Devereux has been appointed westbound and dairy agent and E. M. Snell, a traveling freight agent, both reporting to Mr. King. W. H. Gates has been appointed a commercial agent and E. A. Niswonger, a traveling freight agent, both with office at Louisville, Ky. Thomas Peter has been appointed a commercial agent, with office at Columbus, Ohio. S. A. Townsend, commercial agent at Minneapolis, has been transferred to Pittsburgh, Pa., succeeding J. W. Clark, promoted to division freight agent at Cleveland, Ohio. W. S. Wonder has been appointed a soliciting freight agent, with office at Peoria, Ill.

W. H. Ward, assistant general freight agent of the Chicago, Indiana & Southern at Chicago, has been appointed chief of the tariff bureau of that road and the Indiana Harbor Belt, with office at Chicago. C. C. Campbell succeeds Mr. Ward. H. M. Griggs, assistant general coal and ore agent of the Michigan Central, the Lake Shore & Michigan Southern, the Cleveland, Cincinnati, Chicago & St. Louis, the Toledo & Ohio Central, the Chicago, Indiana & Southern, and the Indiana Harbor Belt, with office at Chicago, has had his jurisdiction extended over the Pittsburgh & Lake Erie and the Lake Erie & Western. C. E. Simpson has been appointed chief of the tariff bureau of the Pittsburgh & Lake Erie, with office at Pittsburgh, Pa. E. J. Dowie, industrial agent of the Lake Shore & Michigan Southern and the Pittsburgh & Lake Erie, with office at Cleveland, Ohio, has had his jurisdiction extended over the Lake Erie & Western, the Ft. Wayne, Cincinnati & Louisville and the Northern Ohio.

Louis Wiler Landman, who was recently appointed general passenger and ticket agent of the Michigan Central, with office at Chicago, as previously announced in these columns, was born December 6, 1868, at Waynetown, Ind. He began railway work in 1886 as a telegraph operator on the Indiana, Bloomington & Western, and the next year he went to Danville, Ill., as ticket agent. He was made city passenger and ticket agent of the Ft. Wayne, Cincinnati & Louisville at Ft. Wayne, Ind., in 1889. For seven years from 1890 he was southern passenger agent of the Columbus, Hocking Valley & Toledo; he was then made general traveling agent in the passenger department, which office he held with that road and its successor, the Hocking Valley, until 1904. His next promotion was to general agent in the freight and passenger departments of the Cleveland, Cincinnati,

Chicago & St. Louis at Toledo, Ohio, and a year later he was appointed general agent in the passenger department of all New York Central Lines at Toledo. He became general western passenger agent of the Lake Shore & Michigan Southern at Chicago in 1906, and during the present year was promoted from that position to general passenger, ticket and baggage agent of the Lake Erie & Western at Indianapolis.

William Albert Newman, whose appointment as general freight agent of the Lake Shore & Michigan Southern, with office at Cleveland, Ohio, has been announced in these columns, was born March 30, 1878, in Metcalfe county, Kentucky. He was educated at Kentucky University, and began railway work in June, 1897, with the Great Northern at St. Paul, Minn. In August, 1902, he became a clerk in the general freight department of the New York Central and the West Shore at New York, and two years later was appointed traveling freight agent. The next year he was promoted to chief clerk to the assistant general freight agent, and in another year to second assistant general freight agent. In May, 1907, he became assistant general freight agent, with office in New York, from which position he has recently been promoted to general freight agent as above.

W. A. Newman.

Engineering and Rolling Stock Officers.

R. B. Harris has been appointed supervisor of Subdivision No. 3, Allegheny division, of the Pennsylvania Railroad, with office at South Oil City, Pa., succeeding A. G. Follette, transferred.

M. C. Blanchard, roadmaster of the Atchison, Topeka & Santa Fe, at Florance, Kan., has been appointed division engineer, with office at Topeka, Kan., succeeding C. E. Griggs, transferred to the operating department.

J. Singleton, roadmaster of the Rock Island Lines at Sibley, Iowa, has been appointed roadmaster, with office at Des Moines, Iowa, succeeding W. F. Lee, deceased. H. Berend, section foreman at Waterloo, Iowa, succeeds Mr. Singleton.

The chief engineer's department and the engineer of branch lines' department of the Pennsylvania Railroad have been consolidated. Joseph U. Crawford, engineer of branch lines, at Philadelphia, Pa., has been appointed consulting engineer, and H. E. Booz, principal assistant engineer of branch lines, has been appointed an assistant chief engineer, both with offices at Philadelphia, Pa., and their former positions have been abolished.

P. A. Pheney, roadmaster of the Idaho division of the Oregon Short Line, at Glenns Ferry, Idaho, has been appointed roadmaster, with office at Nampa, Idaho, succeeding T. Donovan, deceased. Patrick Brennan succeeds Mr. Pheney. F. Reilly, roadmaster on the Salt Lake division of the Southern Pacific lines east of Sparks at Mina, Nev., has been transferred to Wells, Nev., succeeding A. E. Moquist, and Mr. Moquist succeeds Mr. Reilly.

F. A. Torrey, who has been appointed general superintendent of motive power of the entire Burlington system, was born in Pennsylvania, and when a boy obtained an apprenticeship in a machine shop. He has been connected with the Burlington since 1876, serving consecutively as fireman, engineman, road foreman of engines and roundhouse foreman. From 1895 to 1903 he was master mechanic, and he was then for two years assistant superintendent of motive power. He was appointed to succeed Frank H. Clark as superintendent of motive power of the lines east of the Missouri river in April, 1905, and now succeeds him as general superintendent of motive power.

Horace C. Booz, principal assistant engineer of branch lines of the Pennsylvania Railroad, has been appointed an assistant chief engineer, with office at Philadelphia, Pa., and his former position has been abolished. Mr. Booz was born at Bristol, Pa., August 29, 1875, and was educated in the public schools of his native town, also at Rittenhouse Academy, Philadelphia, and at Lafayette College, graduating from the latter in the class of 1895 as a civil engineer. He entered the engineering department of the Pennsylvania Railroad in June, 1896, as a transitman, and in November, 1899, was promoted to division engineer in the same department, becoming assistant engineer in March, 1901. He was appointed principal assistant engineer of branch lines in May, 1905, which position he held at the time of his recent appointment. In addition to his work as chief engineer of brinch lines, Mr. Booz has been since June, 1902, engaged under the direct authority of Samuel Rea, vice-president of the Pennsylvania Railroad, in the various projects under the latter's supervision, the most important of which was the New York tunnel extension of the Pennsylvania Railroad, and the proposed New York Connecting Railroad.

Horace C. Booz.

Joseph U. Crawford, chief engineer of branch lines of the Pennsylvania Railroad, has been appointed consulting engineer, with office at Philadelphia, Pa., and his former position has been abolished. Mr. Crawford was born at Ury Farm, Philadelphia, August 25, 1842, and was educated at John W. Faires' school, from which he went to the University of Pennsylvania in the class of 1862. He served in the Union Army, and in 1871 entered the service of the Pennsylvania Railroad as senior assistant engineer of the Alexandria & Fredericksburg. He was then principal assistant engineer, and afterwards engineer of the California division of the Texas & Pacific, under Colonel Thomas A. Scott and on his recommendation in 1878 Mr. Crawford was appointed consulting engineer of the government of Japan. On the completion of his work in that country he was decorated by the Emperor of Japan with the Order of the Rising Sun. After his return to America he was employed by Jay Gould to make transcontinental examinations and surveys between the Pacific coast and Salt Lake City, Utah, as well as in Wyoming and Nebraska. In the fall of 1882, he returned to the service of the Pennsylvania Railroad as chief engineer of the Schuylkill Valley Railroad, and in 1886 and 1887, built the Piedmont & Cumberland. Two years later he was appointed assistant to J. N. DuBarry, second vice-president of the Pennsylvania Railroad, and on the death of that officer was appointed engineer of branch lines. In July, 1897, he was appointed chief engineer of the Southeastern & Atlantic, now the Norfolk &

J. U. Crawford.

Portsmouth Belt Line, and of the New York, Philadelphia & Norfolk, and from October, 1898, to May, 1899, he was engineer for the United States government to examine into and report upon the transportation facilities in Cuba. At the time of his recent appointment, Mr. Crawford was chief engineer of branch lines of the Pennsylvania Railroad, and in addition, is a director of various companies associated with the Pennsylvania system.

Purchasing Officers.

L. S. Carroll, purchasing agent of the Chicago & North Western, has been appointed general purchasing agent of the North Western and the Chicago, St. Paul, Minneapolis & Omaha, at Chicago, a new office, and his former title has been abolished. John Ball has been appointed assistant purchasing agent, with office at Chicago. Isaac Seddon, purchasing agent of the Chicago, St. Paul, Minneapolis & Omaha at St. Paul, Minn., retains his office and title and will report to Mr. Carroll.

William A. Hammel, whose appointment as purchasing agent of the Atlanta, Birmingham & Atlantic, with office at Atlanta, Ga., has been announced in these columns, was born July 23, 1872, at Baltimore, Md., and received his education in a manual training school and at Washington University. He began railway work in May, 1893, in the engineering department of the St. Louis & San Francisco, and has been in the continuous service of various railway companies up to the present time, with the exception of a period of five years, when he was in private practice as engineer and contractor in and around St. Louis, Mo. He left the service of the St. Louis & San Francisco to go to the Mobile & Ohio as rodman and assistant resident engineer on the extension from Tuscaloosa, Ala., to Montgomery, and then went to the Bolivar, Osceola & Southern, now a part of the St. L. & S. F., as resident engineer. His next position was on the Choctaw, Oklahoma & Gulf, now a part of the Rock Island Lines, as topographic and locating engineer. He was later resident and afterwards division engineer of the Tennessee Central; locating and division engineer of the Lake Erie, Alliance & Wheeling; division engineer, and afterwards locating engineer of the Louisiana Railway & Navigation Company, and for five and a half years resident engineer and assistant chief engineer of the Atlanta, Birmingham & Atlantic, which position he still holds, in addition to his new duties as purchasing agent.

OBITUARY.

J. F. Van Rensselaer, until October, 1910, general agent of the Houston & Texas Central, the Houston East & West Texas and the Houston & Shreveport at Atlanta, Ga., died at Atlanta on January 3.

United States Senator Stephen B. Elkins of West Virginia, died at his house in Washington, January 5, at the age of 69. Mr. Elkins' prominence in the railway world for the last ten years has been due to his position as chairman of the committee of the senate on interstate commerce, and his name was attached to the revision of the interstate commerce law which was passed in 1903, and also, coupled with that of Representative Mann, to the radical revision made last June. The bill of 1903, by repealing the clause of the law which provided for punishment by imprisonment for making illegal rates, was an important factor in enabling the Interstate Commerce Commission to do more effective work in prosecuting offenders. It was this bill that increased the maximum penalty from $5,000 to $20,000. Mr. Elkins was well known to railway men, however, before he went to Congress, having built a number of railways in West Virginia, in connection with his extensive mining and other enterprises in that state. He was for several years vice-president of the West Virginia Central & Pittsburgh; was president of the Piedmont & Cumberland, and chairman of the board of directors of the Morgantown & Kingwood. Mr. Elkins was born in Ohio, but when a child went with his family to Missouri and was one of the first graduates from the University of Missouri. In 1864 he went to New Mexico and was prominent in politics there. He was made Territorial Delegate in congress and while in Washington married the daughter of Senator H. G. Davis of West Virginia; and in all his subsequent career he was identified with that state. He was Secretary of War from 1891 to 1893 and was chosen senator from West Virginia in 1895.

Railway Construction.

New Incorporations, Surveys, Etc.

ALBERTA CENTRAL.—The Railway Commission of Canada has extended the time to July 1, 1911, for the completion of a branch at Rocky Mountain House, Alb.

ARIZONA ROADS.—Surveys are being made for a line from Holbrook, Ariz., to Bear Springs, 58 miles. W. H. Clark, Holbrook, is said to be back of the project.

ATCHISON, TOPEKA & SANTA FE COAST LINES.—This company will spend $850,000 for improvements, it is said in Bakersfield and the San Joaquin valley during 1911. The line from Richmond to Bakersfield is being relaid, the roadbed widened and rock ballast is being put in. Many of the wooden culverts and bridges will be replaced with steel and concrete structures. A new station is to be built at Bakersfield.

BOSTON (MASS.) SUBWAYS.—See an item in General News regarding new subways to be built in Boston.

BUFFALO & NORTHWESTERN.—This company was chartered recently in Oklahoma with $50,000 capital, and headquarters at Buffalo, Harper county. Surveyors have been at work for several weeks in Woods county towards Alva. The plans call for building about 258 miles.

CANADIAN PACIFIC.—The Railway Commission of Canada has authorized this company to open for traffic the section of its Ingersoll branch from Ingersoll Junction, Ont., to Ingersoll, 4.8 miles. This company is said to have under consideration the question of building a new connecting line between Nepigon, Ont., and Savanne. It is estimated that the new line will be from 40 to 50 miles shorter than the existing line.

Plans have been made by the Canadian Pacific, it is said, for building a tunnel under the city of Vancouver, B. C., to connect the False creek yards and shops of the company, with the wharves and station on the water front.

CHATTANOOGA & ATLANTA.—Incorporated in Georgia with $20,000 capital and office at Menlo, Chattanooga county, Ga. The plans call for building a line to connect two or three existing lines, to complete a through line between Chattanooga, Tenn., and Atlanta, Ga. The incorporators include: E. F. Bloomeyer, C. N. Fisk, W. P. Means, Chattanooga, and C. A. Land.

CHICAGO, MILWAUKEE & PUGET SOUND.—According to press reports plans have been filed at the land office in Kalispeel, Mont., showing the route of a proposed branch from Clearwater, which is 40 miles east of Bonner, north via Kalispeel to the international boundary, about 200 miles.

COLORADO & SOUTHERN.—Track laying has been started on the double-track line being built jointly by this company and the Denver & Rio Grande between Pueblo, Colo., and Walsenburg. It is expected to have the first 20 miles ready for operation by February 1, and 24 miles additional, to complete the line, ready for operation about September. (November 18, p. 986.)

COLUMBUS CONNECTING.—Organized in Ohio with $25,000 capital, to build a belt line around the city of Columbus, Ohio, at a cost of about $6,000,000.

DENVER & RIO GRANDE.—See Colorado & Southern.

DUNKIRK, ALLEGHENY VALLEY & PITTSBURGH.—See New York Central Lines.

GRAND TRUNK PACIFIC.—An officer is quoted as saying that it is expected to have work on this road from the headwaters of the Bay of Fundy, at Moncton, N. B., west to Prince Rupert, B. C., on the Pacific ocean, finished early in 1913. The company expects to keep about 6,000 men at work during the winter on various sections of the western end of the line. There are to be four tunnels on the Pacific section, aggregating about 2,200 ft., one of which is already finished and another will be pierced in March.

HAGERSTOWN & CLEARSPRING (Electric).—An officer writes that this company proposes to let contracts before March 1, to build from Hagerstown, Md., to Clearspring, 12 miles. There will be one steel bridge. L. N. Downs, Hagerstown, may be addressed.

Imperial Traction Company.—Incorporated in Ontario, to build from Hamilton, Ont., to connect Guelph, Berlin, Stratford, London, Ingersoll and Branford, with a branch to Niagara Falls, also, a branch from a point between Stratford and St. Marie to Grandbend and Sarnia. L. B. Howland, Toronto, may be addressed.

Joplin, Oklahoma & Western.—Surveys have been made, it is said, from Joplin, Mo., west to Carmen, Okla. Construction work is to be started next month at Welch. W. P. Chapman, New York and F. M. Overlees, Bartlesville, Okla., are interested. H. H. Jackson, chief engineer, Chicago.

Kansas Roads (Electric).—Plans are being made to build from Baldwin, Kan., east via Black Jack, Edgerton and Gardner to Olathe, 20 miles. Dr. H. L. Murlin, Baker University, Baldwin, is interested.

Lafourche Valley & Gulf.—Financial arrangements are said to be made and it is expected that work will be started soon, from Donaldsonville, La., northwest to Leesville, 150 miles. F. M. Welch, president, Donaldsonville.

Lake Erie & Northern.—Application has been made for a charter in Canada, to build lines to connect Port Dover, Ont., Simcoe, Waterford, Brantford, Paris and Galt. W. S. Brewster, J. Muir, W. D. Schultz and R. E. Ryerson, all of Brantford, and H. Donly, are interested.

Laramie, Hahn's Peak & Pacific.—An officer is quoted as saying that contracts have been let for completing an extension from Fox Park, Wyo., south to Walden, Colo., and to the coal fields of the Colorado Coal Co.

Lewisburg, Milton & Watsontown (Electric).—This company is now operating cars into Lewisburg, Pa., the Simplex Surface Contact Co. having completed the electrification of the Lewisburg & Tyrone branch between Lewisburg and Montandon. The company is planning to carry out the electrification between Lewisburg and Mifflinburg.

Louisiana Roads.—According to press reports, D. K. and M. J. Jeffris, owners of a number of lumber mills and railway property in Concordia Parish, La., are building a line between the Mississippi and Black rivers in Louisiana, and may eventually extend the line west to Alexandria. John Drake, Chicago, is said to be interested.

Louisville & Nashville.—An officer is quoted as saying that this company will spend about $3,500,000 building an extension into eastern Kentucky, 98 miles. (December 23, p. 1204.)

Milwaukee Western Electric.—This company has finished surveys and secured about 65 per cent. of the right-of-way between Milwaukee, Wis., and Foxlake. The line will have a grade not to exceed 1.3 per cent. There will also be a branch from Sussex to Waukesha. C. A. Chapman, Inc., Chicago, are the engineers. (October 28, p. 811.)

Minneapolis, St. Paul & Sault Ste. Marie.—This company, it is said, is planning to make extensive additions to its yards at Superior, Wis., to accommodate the handling of the ore business from the Cuyuna range. When the improvements are made the yards will be 600 ft. wide and two miles long.

Montana Roads (Electric).—Residents of Big Fork, Mont., Columbia Falls and Butte are said to be back of a project to build an electric line from Columbia Falls, south along the east side of Flathead lake and river to Polson, about 70 miles. The work is to be started in March.

Murray Traction Company.—Surveys are being made, it is said, from Murray, Ky., to the Tennessee river, about 16 miles. N. Ryan, president, Murray.

Nashville-Gallatin Interurban.—Under this name a company will ask for incorporation to build from Nashville, Tenn., northeast to Gallatin, about 30 miles. The plans call for putting up about four steel bridges. It is expected that work will be begun this coming summer. H. H. Mayberry, Franklin, may be addressed.

New York Central Lines.—The Dunkirk, Allegheny Valley & Pittsburgh has given a mortgage, part of the proceeds of which may be used for an extension from the present terminus at Titusville, Pa., to either Oil City or Franklin, where connection is to be made with the Franklin branch of the Lake Shore & Michigan Southern.

North Carolina-Virginia.—Incorporated in Virginia with $5,000 capital, to build from a point in Henry county, Va., via Ridgeway, to a point in North Carolina, six miles. E. C. Wing, president, New York, and M. K. Harris, Danville, Va., is interested.

Oklahoma Short Line (Electric).—Incorporated in Oklahoma, to build an electric line from Oklahoma City, Okla., to Joplin, Mo., 175 miles; also to build a line from Shawnee, Okla., to Denison, Texas, 125 miles. The incorporators include: C. C. Wright, Ada, Okla.; M. J. Bentley, Tecumseh; P. Paddock, Oklahoma City; S. V. Sanders, Albemarle, S. C., and T. E. Armentrout, Kirkwood, Mo.

Pittsburgh & Susquehanna Valley.—This company has given a mortgage for $2,000,000 to secure funds for building an extension from the present terminus near Waltzvale, Clearfield county, Pa., southwest to Patton. The line will reach an undeveloped coal section in the Beaver valley.

Port Bolivar Iron Ore.—A contract has been given to the C. H. Sharp Construction Company, Kansas City, Mo., to build from the Texas & Gulf, at Longview, Texas, to the iron ore fields in Cass county, about 30 miles. (December 16, p. 1167.)

Southwestern Kansas & Colorado.—Right-of-way is being secured, it is said, from Hardtner, Kan., west through Barber, Comanche, Clark and Meade counties, about 100 miles. A. A. White, general manager, Coldwater. The Titus Company, Arkansas City, are the engineers.

Taxco, Naranjo & Guerrero.—An officer writes that this company expects to begin work soon from Taxco, Mex., via San Sebastian to Naranjo, 10 miles, with a branch to Santa Ana, about 21 miles. There will be three steel bridges, each about 20 ft. long, and station buildings are to be put up at Taxco, San Sebastian and Naranjo. The line is being built to carry ore, fuel and general merchandise. H. C. Wilson, president, 52 Dearborn street, Chicago, and F. E. Olendorf, Taxco, is also interested.

United Property Company.—Incorporated in Delaware to build and operate railways, steamship lines, wharves, docks and warehouses. The offices will be at San Francisco, Cal., and Oakland. The directors include H. W. Davis, Wilmington, Del.; F. M. Smith, R. G. Hanford, W. R. Alberger and D. Searles. The new company is said to represent a merger of many of the public utilities companies of Berkeley, Cal, and Oakland, including the ferry lines that connect those places with San Francisco.

Washington Roads (Electric).—Application has been made for a franchise by J. D. Cleary, representing Pennsylvania capitalists, to build an electric line from South Bend, Wash., east to Raymond, about four miles.

Wabash Railroad.—Work is now under way by the William Carmichael Co., St. Louis, Mo., it is said, on 30 miles of double-tracking from Delray, Mich., to Adrian.

Western Maryland.—Right-of-way has been secured, it is said, to build an extension from York, Pa., across Codorus creek, to the northern end of the borough of North York.

Wrightsville, Adrian & Lyons.—This company, which was organized to build from Wrightsville, Ga., southeast to Lyons, about 40 miles, with a number of extensions, has grading work finished on about 35 miles. The company expects to carry out all the work with its own men. T. J. James, president, Adrian. (July, 15, p. 143.)

FOREIGN RAILWAY NOTES.

The Great Western of Brazil Railway has been given the privilege of building about 31 miles from Garanhans to Bom Conselho, on the Sul de Pernambuco Railway.

The preliminary surveys for the proposed railway from the capital of the Dominican Republic to the Cibao district have commenced. One party of engineers is working north and another party will soon be started in the north. A government report on this new line will be loaned to interested firms who apply to the Bureau of Manufactures, Washington, D. C.

Railway Financial News.

ANN ARBOR COMPANY.—This company has been incorporated with an authorized capital stock amounting to $7,250,000. The company is to own railway securities and in particular to own the $3,100,000 common stock and the $2,190,000 preferred stock of the Ann Arbor which was recently sold under foreclosure of the $5,500,000 5 per cent. notes of the Detroit, Toledo & Ironton, and which stock, carrying control of the Ann Arbor, was bought by Joseph Ramsey, Jr.

ANN ARBOR RAILROAD.—Farson's Son & Co., New York, are offering $600,000 first lien 5 per cent. equipment notes, series B, dated January 1, 1911 of the Ann Arbor, at prices to yield 5⅜ per cent. on the investment.

BALTIMORE & OHIO.—In the article on changes in railway ownership and control published in our issue of December 30, we said that the Baltimore & Ohio had sold a controlling interest in the stock of the Valley Railroad Company to the Southern Railway. This we are advised is a mistake.

CANADIAN PACIFIC.—This company has increased its dividends from 8 per cent. to 10 per cent. per year by the declaration of a regular quarterly dividend of 1¾ per cent., together with ¾ per cent. dividends declared from land sales. In 1910 the company paid 7 per cent. regular dividends and 1 per cent. extra dividends from land sales.

CARTHAGE, WATERTOWN & SACKETT'S HARBOR.—In addition to the 5 per cent. extra dividend paid December 31, 1910, there was also an extra dividend of 10 per cent. paid in 1909; the regular dividend rate from 1900 to 1908 being 5 per cent.

CINCINNATI, BLUFFTON & CHICAGO.—This property is to be sold by the receiver at Huntington, Ind., on March 15; the upset price being $800,000.

CLEVELAND & MARIETTA.—The directors have declared a dividend of 6 per cent.

KENTUCKY & INDIANA TERMINAL RAILROAD.—This is the new name of the Kentucky & Indiana Bridge and Railroad.

KENTUCKY & INDIANA TERMINAL RAILROAD.—This company has sold to J. P. Morgan & Co., New York, $5,000,000 first mortgage bonds. The proceeds of the sale are to be used to retire existing mortgages, and the company intends to begin building the new bridge across the Ohio river, between New Albany and Louisville at once.

METROPOLITAN STREET RAILWAY.—A reorganization plan for this company has been filed with the New York Public Service Commission, First district. The plan provides for securities, including new securities to be issued and old securities left undisturbed, to a total amount of about $96,000,000, which is a reduction of about $40.000,000 from the present oustanding securities and obligations. The new securities to be issued are $11,468,000 new fixed charge 4 per cent. bonds, $39,000,000 new adjustment income bonds and $14,000,000 stock. It is estimated that $10,000,000 cash will be required, and this sum is to be raised by an assessment of approximately 17.67 per cent. on the Metropolitan Street Railway stock. The plan does not provide for the participation of the Metropolitan Securities Company, or of the New York City Railway. The plan provides for the participation in the reorganization of holders of personal injury claims, giving them the same terms as the most favored bondholders; no assessment being required of these holders of personal injury claims.

The *Wall Street Journal* says that failure of the Interborough Metropolitan Company, which is the holding company for the Metropolitan Street Railway and the Interborough Rapid Transit, to meet the necessary assessment on the Metropolitan Street Railway stock which it owns, will probably mean the buying in and operation of the Metropolitan Street Railway at foreclosure by Stone & Webster.

NATIONAL RAILWAYS OF MEXICO.—The gross earnings of the National Railways of Mexico (this company is not shown in our table of monthly earnings and expenses of railways) amounted to $5,247,963 in November, 1910, comparing with $4,946,835 in November, 1909. Operating expenses amounted to $3,041,995 in 1910 and to $3,075,954 in 1909. Net earnings totaled $2,205,967 in 1910, an increase of $335,086 over 1909. Operating ratio in 1910 was 57.97, and in 1909 62.18.

NORFOLK SOUTHERN.—A special meeting of stockholders has been called for January 30 to vote on the question of making a new mortgage to secure $35,000,000 bonds, the new mortgage to replace the mortgage securing $12,000,000 bonds originally planned under the reorganization. It is understood that holders of nearly, if not fully, 75 per cent. of the stock has indicated approval of the new mortgage, the consent of 75 per cent. of the stock being required to make the new mortgage valid. Of these new bonds, $5,780,000 are to be sold to retire $4,360,000 one-year notes sold in October, and $3,220,000 will be substituted for old bonds in the hands of the trustees which are now held to retire a like amount of underlying bonds. Of the old bonds $9,000,000 were issued ,$5,780,000 being deposited as collateral for one-year and $3,200,000, as noted above, are held to retire underlying bonds.

READING COMPANY.—It is understood that if the Reading Company makes a bond issue, as is rumored, it will be in connection with refunding the Philadelphia & Reading $18,811,000 consolidated 6 per cent. and 7 per cent. bonds which fall due June, 1911.

SOUTHERN PACIFIC.—The United States Senate has passed a bill to reimburse the Southern Pacific for expenditures made in 1907 in connection with controlling the overflow of the Colorado river. The bill provides for a payment of $773,000.

A press dispatch from Los Angeles, Cal., says that about 15 miles of land along the harbor front, presumably at San Pedro, held by the Southern Pacific and other railways, has been declared public property by Superior Judge Bordwell, in a decision in a suit brought by the Municipal Harbor Commission. It is understood that the Southern Pacific will appeal. The press dispatch says that the estimated value of the land was $5,000,000.

SOUTHERN RAILWAY.—See Baltimore & Ohio.

ST. JOSEPH & GRAND ISLAND.—Henry Hoffman, J. August Barnard, Willard V. King, Solomon A. Guiterman and George M. Williamson have formed a committee to protect the minority stockholders of the St. Joseph & Grand Island, in the matter of resumption of dividends in the $5,500,000 first preferred stock, of which the Union Pacific owns $1,415,100. George M. Williamson with A. Hickman, No. 37 Wall street, New York, secretary.

VALLEY RAILROAD.—See Baltimore & Ohio.

WESTERN MARYLAND.—William Salomon & Co., New York, are offering $1,500,000 Western Maryland first mortgage 4 per cent. bonds at 87, yielding about 4.70 on the investment. After August 1, 1911, the mortgage securing these bonds will become a direct lien on nearly the entire mileage of the Western Maryland.

WILMINGTON, NEW CASTLE & SOUTHERN.—The section of this property between Wilmington, Del., and New Castle, five miles, has been sold under foreclosure to S. Hanford for $100,000.

FOREIGN RAILWAY NOTES.

All freight shipped to Asuncion, Paraguay, must be marked "Transito para Ascunsion," in order to avoid customs duties in Montevideo, Uruguay, and Buenos Aires, Argentina.

The report of the Buenos Ayres Great Southern Railway for the year ended June 30, 1910, show the largest earnings in the history of the company, with the exception of the year previous. The gross earnings were $23,009,620, as compared to $23,247,500 in 1909. This is the first time in sixteen years that the gross earnings did not show an increase over the previous year. This falling off in revenue is directly traceable to the abnormal drought and frosts which prevailed throughout the Argentine Republic and were most disastrous to the crops in the region served by the Buenos Ayres Great Southern. Operating expenses were reduced $72,205 from the year previous, and had it not been for increased contributions to renewal and other funds this reduction would have amounted to $309,875. The net revenue for 1910 was $10,425,860, as compared to $10,591,530.

Supply Trade Section.

F. W. Allen, formerly superintendent of the Buffalo & Susquehanna, at Galeton, Pa., has been made sales agent for the Weir Frog Company, Cincinnati, Ohio.

J. H. Burwell, railway sales agent representing the Seeger Refrigerator Company, St. Paul, Minn., has moved his office from 149 Broadway, New York, to the Grand Central Terminal.

The position of vice-president in charge of sales of the Crawford Locomotive & Car Company, Streator, Ill., has been abolished, and the duties of the office will hereafter be performed by William J. Ball, mechanical engineer.

The Dressel Railway Lamp Works, New York, will furnish a number of 150-candle power oil headlights for installation on Lake Shore & Michigan Southern locomotives in use in the state of Indiana, to comply with the headlight statute in that state.

The Smith locomotive adjustable hub plate, made by The Smith Locomotive Adjustable Hub Plate Company, Pittsburgh, Kan., has been adopted as standard on the Kansas City Southern. It is being tried out by the Delaware & Hudson and the St. Louis & San Francisco.

Charles H. Morgan, prominent as a mechanical engineer and an official of one of the United States Steel Corporation's subsidiary companies, died at his home in Worcester, Mass., January 10. In 1899 he was elected president of the American Society of Mechanical Engineers, New York.

The Lehigh Valley Transit Company, Allentown, Pa., has placed an order with the Westinghouse Machine Company, Pittsburgh, Pa., for one 4,000-k. v. a. turbo-generator set. The turbine is to operate with 175 lbs. pressure, 100 deg. superheat, and a 28-in. vacuum. The generator is designed for 3-phase, 25-cycle operation at 13,300 volts.

D. W. Call, assistant to the president of the American Steel Foundries, Chicago, has been elected president of the Allis-Chalmers Company, Milwaukee, Wis. Mr. Call, who is of Scotch descent, was born near Cleveland, Ohio, and at the age of 17 began his business career in Cleveland. For 23 years he has been engaged in active business life in connection with large manufacturing corporations, both in this country and in Canada.

The Detroit Seamless Steel Tube Company, Detroit, Mich., announces the opening of a branch office at 1333-4 McCormick building, Chicago, in charge of W. E. Marvel, formerly manager of the St. Louis branch of the Buda Company, Chicago. Mr. Marvel will have the title of western sales manager, and will have charge of all western and southwestern business of the company, and also of the Michigan Malleable Iron Company and the Monarch Steel Castings Company, both of Detroit.

The Western Electric Company, Chicago, has this year changed its fiscal year to end December 31, instead of November 30. For the 13 months ended December 31, 1910, its sales amounted to approximately $66,000,000 as compared with $45,000,000 for the 12 months of last year. These sales for 1910 compare with $69,000,000 for the year 1906, which was the largest year in the history of the company. The increase over the past year has been well distributed over the various lines which the company handles. The company during the past year has continued its policy of concentrating the manufacturing at Hawthorne, Ill., and several millions of dollars have been spent there in new buildings. In the latter part of 1910 more new buildings, to cost $1,000,000, were authorized, which will still further increase the capacity of the plant. The company now employs altogether upwards of 24,000 men.

TRADE PUBLICATIONS.

Grip Nuts.—The Grip Nut Company, Chicago, has issued a folder giving valuable information regarding the use of grip nuts in railway service. Figures on the initial economy and amount of service secured from these nuts are clearly presented.

Air Compressors.—The Ingersoll-Rand Company, New York, has published its bulletin No. 3007 on class P B duplex power-driven air compressors. This illustrated bulletin contains 24 pages and gives full information on the advantages of and improvements in these air compressors.

RAILWAY STRUCTURES.

BAKERSFIELD, CAL.—See Atchison, Topeka & Santa Fe Coast Lines under Railway Construction.

BELLEVILLE, ONT.—The Railway Commission of Canada has ordered that five piers be used in the construction of a railway bridge over the Moira river at Belleville.

BUFFALO, N. Y.—A number of bridges are to be built over Buffalo river in connection with the change of grade work, to be carried out by some of the railways entering Buffalo.

CAPE COVE, QUE.—See Grand River, Que.

COLIMA, MEX.—The National Railways of Mexico have let contracts for building new passenger stations at Colma, Iguala and Cuernavaca.

CUERNAVACA, MEX.—See Colima, Mex.

FLOSSMOOR, ILL.—The Illinois Central is taking bids on a one-story brick passenger station to cost $10,000.

GALVESTON, TEXAS.—Since passage of the ordinance by the City Commission of Galveston closing the necessary streets to allow the building of a union passenger station, preliminary plans have been completed, which provide for a union station to cost $200,000.

GLENN, ILL.—The Chicago & Alton has announced that the location of its new terminal yard 10 miles from Chicago will be known as Glenn, Ill. The yard will cover 295 acres and will cost about $2,500,000. The new yard will take the place of the present terminal at Brighton Park.

GRAND RIVER, QUE.—The Railway Commission of Canada has approved the plans of the Atlantic, Quebec & Western for putting up a passenger station at Grand River, also for a station at Cape Cove.

MONTESANO, WASH.—The Northern Pacific will build a passenger station at Montesano.

OGDEN, UTAH.—The Denver & Rio Grande has completed plans for a new freight and passenger station to face on Twenty-fourth street. Work is expected to begin early in the spring, and the cost of the improvement is estimated at $50,000.

PULLMAN, ILL.—The Kensington & Eastern has secured a terminal site adjoining the suburban station of the Illinois Central, and plans to build a passenger station at a later date.

READING, PA.—The Philadelphia & Reading is said to have approved plans for a new reinforced concrete bridge to be built over their tracks at Penn street, in Reading, to replace the present structure, which has been condemned.

SCRANTON, PA.—The city officials and representatives of the Delaware & Hudson, the Central of New Jersey and the New York, Ontario & Western will be asked to consider the question of building a new union station in Scranton. The Central of New Jersey already has under consideration plans for a new station to be built about 15 ft. east of the structure recently destroyed by fire.

TACOMO, WASH.—The Northern Pacific and the Oregon & Washington have made preliminary plans for a double-track bridge to be built over the city waterway at Tacoma. (December 30, p. 1283.)

WATERTOWN, ONT.—The Railway Commission of Canada has authorized the Grand Trunk to put up a new iron bridge to carry the public highway in the township of East Flamboro over the Grand Trunk tracks, to replace the present structure.

WAYNESBORO, PA.—The City Council has under consideration the question of building a subway under the railway tracks at Third street, in Waynesboro.

WHITELAND, TEXAS.—The Gulf, Colorado & Santa Fe will build extensive yards at the new town site of Whiteland, McCulloch county. A station will also be built for the joint use of the Santa Fe and Frisco. Work will commence at once and the cost of the station will be about $3,000.

Late News.

The items in this column were received after the classified departments were closed.

Contract will be let at once by the Lehigh & New England to build from Danielsville, Pa., to Tamaqua, 32 miles.

J. W. Leonard, general manager of the eastern lines of the Canadian Pacific has been appointed assistant to vice-president, with office at Montreal, Que.

The Erie, mentioned in the *Railway Age Gazette* of November 11 as having placed some rail orders, has ordered 24,000 tons of rails from the Carnegie Steel Company. The Great Northern is said to have ordered 3,800 tons of rails.

Northern Pacific has made a reduction of 20 per cent. in the freight rates between Duluth and International Falls, effective January 12. The change is brought about by the opening of the Duluth, Rainey Lake & Winnipeg, which has a much shorter line.

The Lehigh Valley has notified the Pennsylvania state railroad commission that it will make rates complying with the law of May 31, 1907. This road had refused compliance and the commission had asked the attorney-general to go to the courts to compel obedience.

Elbert H. Gary, chairman of the United States Steel Corporation, after the yearly dinner, given Wednesday night to steel manufacturers, gave out a statement in which he said that the men present at the meeting agreed that the present prices of steel were "not only reasonable but very low," and agreed in opposing any reduction.

An issue of $7,000,000 of the 5-20-year general lien bonds of the St. Louis & San Francisco Railroad have been sold to Speyer & Co., who are offering them at 87 simultaneously with Speyer Brothers in London, Lazard Speyer-Ellissen in Frankfort, Germany, the Deutsche Bank in Berlin, Teixeira de Mattos Brothers in Amsterdam, and L. Behrens & Soehne in Hamburg. At the subscription price the bonds yield 6¼ per cent.

A press despatch from Lisbon, January 11, says that railway traffic in Portugal has been completely stopped by a general strike of employees; and that at the same time a large proportion of the workers in the stores and warehouses in Lisbon struck. The railway employees had already secured some betterment of their wages and hours, but they want more. Dr. d'Almeida, Minister of the Interior, had been trying vainly to negotiate a settlement for two days. Troops were sent to various places to keep order. There were a few disturbances in some parts of the city.

An advance of 14 per cent. in wages for the maintenance of way men on the Grand Trunk Pacific system has been granted by the conciliation board to whom the matter had been given for adjudication. This is the first decision in three specific cases of demand on the part of maintenance men for increased wages, and a betterment of working conditions, which the conciliation board has been called upon to handle. The remaining two cases are concerned with the men of the Canadian Northern and the Canadian Pacific. Both of these cases, it is expected, will be settled within a fortnight.

Pennsylvania Railroad directors have adopted resolutions to submit to the annual meeting a proposition to increase the capital stock by $100,000,000. President McCrea, in announcing the proposed increase of $100,000,000 in capital stock, said: "The company's needs of this year, to provide for maturing obligations and necessary improvements, require the raising of between $30,000,000 and $40,000,000. It is therefore proposed, should the resolution submitted by the directors to the stockholders meet with favorable action, to make a stock allotment of 10 per cent. at par. It is not the intention at this time to issue any part of the $100,000,000 for which authorization is asked, excepting so much as is necessary to supply this proposed issue of 10 per cent., but the authority is now asked for that the directors may be able to make further issues of stock from time to time in the future as the requirements of the company may make such issues necessary."

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Pittsburgh & Lake Erie is said to be in the market for 24 locomotives. This is not yet confirmed.

The Philadelphia & Reading, it is said, will build 20 locomotives at its shops. This is not confirmed.

The Seaboard Air Line is said to have ordered 10 consolidation locomotives from the Baldwin Locomotive Works.

The Coudersport & Port Allegany has ordered 1 American type locomotive from the Baldwin Locomotive Works.

The New York & Pennsylvania has ordered 1 fifty-ton American type locomotive from the Baldwin Locomotive Works.

The Bingham & Garfield, Salt Lake City, Utah, is said to have ordered 10 locomotives from the H. K. Porter Company. This is not yet confirmed.

The Pittsburgh, Shawmut & Northern has ordered 20 consolidation locomotives and 2 Mikado switching locomotives from the Baldwin Locomotive Works.

The Harriman Lines, it is understood, are negotiating with the Baldwin Locomotive Works for 196 locomotives. The types have not been decided on, so no final order has been given.

The Kentucky & Indiana Bridge Company, mentioned in the *Railway Age Gazette* of January 6, has ordered 2 six-wheel switching locomotives from the Baldwin Locomotive Works.

The Canadian Pacific, as mentioned in the *Railway Age Gazette* of December 30, has ordered 10 switching locomotives, 5 Mallets, 20 consolidation locomotives, and 18 ten-wheel locomotives from the Canadian Locomotive Company, and 10 consolidation and 12 Pacific type locomotives from the Montreal Locomotive Works.

CAR BUILDING.

The Vandalia is said to be making inquiries for 150 freight cars.

The Pennsylvania Lines West have stopped their inquiries for 1,000 hopper cars.

The North Coast has ordered one 70-ft. gasolene motor car from the McKeen Motor Car Company.

The Kanawha & Michigan, as mentioned in the *Railway Age Gazette* of January 6, is considering an order for 2,000 coal cars.

The Seaboard Air Line is said to have ordered 10 coaches and 3 combination passenger and baggage cars from the Pullman Company.

The Northern Pacific has ordered 3 baggage cars and 2 combination baggage and passenger cars from the American Car & Foundry Company.

The Lange Soap Company, San Antonio, Texas, has ordered six 8,000-gal. steel underframe tank cars from the American Car & Foundry Company.

The Great Northern mentioned in *Railway Age Gazette* of December 2, as in the market for 400 hopper cars, has ordered this equipment from the Haskell & Barker Company.

The St. Louis Southwestern, mentioned in the *Railway Age Gazette* of December 30 as being in the market, has ordered 1,500 box cars and 500 furniture cars from the American Car & Foundry Company.

The Baltimore & Ohio is said to have ordered 500 steel-underframe freight cars from the American Car & Foundry Company, and an additional 500 from the Haskell & Barker Car Company. This is not yet confirmed.

The Canadian Pacific, as mentioned in the *Railway Age Gazette* of December 30, has ordered 2,000 freight cars and 750 flat cars from the Canadian Car & Foundry Company, and 200 coaches from the company's Angus shops. It is in the market for 500 stock cars.

IRON AND STEEL.

The Northern Pacific has ordered 600 tons of bridge steel from the American Bridge Company.

The Chicago City Railways are said to be in the market for 15,000 tons of rails. This is not yet confirmed.

The Oregon-Washington Railroad & Navigation Company has ordered 8,000 tons of bridge steel from the American Bridge Company for the double-deck bridge over the Willamette river at Portland, Oregon.

General Conditions in Steel.—There are no indications of improvement in the steel industry at present, but it is generally believed that the bottom has been reached and while there may be further falling off in some lines, the change is likely to be for the better. No reduction in prices is expected.

Cuspidor for Smoking Cars.

The floors of smoking cars and smoking compartments in chair cars are often offensive and unsanitary because cuspidors are not provided, and it is difficult to enforce the order "do not spit on the floor," unless some convenience of this kind is provided. The Modern cuspidor, which is here illustrated, was specially designed to meet this requirement. Its

The Modern Cuspidor.

peculiar feature is in having no top, and the bottom is provided with numerous ribs which extend up level with the top, so that although entirely open one cannot step into it. It will not upset and cannot be kicked over. It can be easily and thoroughly cleaned by turning on the hose. The Modern cuspidor, furnished in brown Japan, is made in three sizes—8 in., 10 in. and 12 in. diameter—and is supplied by Jacob Fitz & Sons Company, Columbus, Ohio.

Edison-Beach Storage Battery Car.

All unnecessary weight is eliminated in this car by using the best materials and designs. Each wheel is as independent as are the wheels of automobiles, and each one is driven by its own motor. Naturally when two wheels are joined together rigidly on the same axle and the car is forced around a curve, the outside wheel travels further than the inside one. Therefore, the inside wheel must slip and grind against the inside rail with consequent increased consumption of power and wear of wheel and rail. The wheels are mounted on roller bearings. Silent chains are used to transmit the power from the motors to the wheels, with consequent quiet running and the absence of all gear noises so common on trolley cars.

The car seats 45, and will hold 100 persons. On each side are two longitudinal seats, the same as in the Hudson & Manhattan tunnel cars. Under the seats are placed the Edison storage batteries—180 in all, and of the A-8 type. A separate set of batteries supplies current for the lights, and these are also kept under the seats. The car will travel 85 miles per charge on the basis of stopping ten times per mile, letting off and taking on passengers. If allowed to run without stops it would probably run 125 miles. The car has reached a speed of 35 miles an hour on a straight and level track.

There are four motors, each of which is rated at 5 h. p., or 20 h. p. in all. The car weighs about 9 tons, and accelerates one mile per hour per second; that is, at the end of the first second after starting, it is traveling at one mile per hour; at the end of the second, two miles per hour; at the end of the third, three miles per hour, etc., until fully accelerated. It is said to consume one-fifth the amount of electricity per car mile that the ordinary trolley car consumes and can be operated on the branch lines of railways at one-eighth the cost of operating a train consisting of a locomotive and one or more cars.

The car is equipped with a Klaxon warning signal on each end, operated by the same batteries that run the motors. They were specially designed for this work, and can be heard as far ahead as the steam whistle of a locomotive. The car is the result of the development in automobiles. It utilizes the roller bearing in the wheels, and is operated by Edison storage batteries, which were primarily designed for operating automobiles. So great have been the refinements in eliminating friction and weight, that whereas the battery equipment in the car will drive it for 85 miles, the same battery in a clumsy, unnecessarily heavy trolley car would not drive it ten miles. The cars are made by the Edison-Beach Storage Battery Car Company, New York.

Improved Lifting Jacks.

The patent granted to Chas. H. Hylander on December 6, 1910, for an improvement on lifting jacks has been assigned to the Duff Manufacturing Company of Pittsburgh, Pa. It prevents the trip lever from permanently dropping in and releasing the raise bar. The standard type of trip jack made by the Duff Company has a lifting capacity of 10 tons. The leverage is compound and double acting, lifting the load a half a notch on both the upward and downward strokes. The load may be dropped from any elevation at the will of the operator by means of the trip lever. While these jacks have given good satisfaction, the makers desired to make them even safer and more reliable; thus the Hylander device was perfected and patented. Attached to the trip lever it prevents the jack from dropping back, and the operator has absolute control of the jack and the load it is lifting at all times. The trip jack is especially valuable in track work, although it is adapted for other classes of work.

The Duff Company manufactures every kind of lifting jack used, and has spent almost 30 years in the development and manufacture of jacks. It is the sole manufacturer of Barrett's automatic lever jacks, the Duff ball bearing screws, Duff-Bethlehem forged steel hydraulic jacks, geared ratchet lever jacks, automobile and motor truck jacks, telescope screw jacks, oil well jacks, pipe forcing jacks, motor armature lifts, traversing bases, etc.

Curtis Train Lighting Turbines for Suburban Service.

The Chicago, Burlington & Quincy, after a careful study of the train lighting problem, has standardized a system for suburban service which is well adapted to meet its requirements. The suburban trains, consisting of standard suburban passenger coaches are lighted by electricity, each coach being equipped with twenty-one 16 c. p. lamps. Four lights are furnished for platform illumination, one for the toilet-room and 16 are placed in the body of the car underneath the deck sash. In the locomotive cab a suitable number of electric lamps are used to illuminate the gages and for portables. The locomotive headlight which has been adopted is a 50 c. p. carbon filament stereopticon lamp, arranged with the usual reflector, and is said to give six times as much light as the oil lamp which is usually used in suburban service. There is a marble panel in the cab of the locomotive equipped with a voltmeter and rheostat, the latter permitting adjustment to meet the varying load on the lamp circuit.

The electric current is supplied by Curtis turbo-generator sets mounted on the locomotives. The sets are iron clad, the covers being fitted with gaskets so that they are storm proof. The turbines take steam at the boiler pressure used on different classes of engines, which varies from 140 to 180 lbs., the governor taking care of these variations. The oil cups are large, making it unnecessary to fill them oftener than once a week. The turbine is direct coupled to a 110-volt generator. In general, operation of these train lighting sets involves only the opening of the steam valves when it is desired to put the turbines in operation, and closing the valves to shut them down. Absolute reliance is placed on the electric lighting equipment, as no other means of illumination is provided. The Chicago, Burlington & Quincy also uses the Curtis turbo-generator for illuminating its through trains.